

# Data Evaluation Report on the Chronic Toxicity of Ipconazole TG to Mysids (*Americamysis bahia*)

PMRA Submission Number {.....}

EPA MRID Number 50621301

<b>Data Requirement:</b>	PMRA Data Code {.....}
	EPA DP Barcode 449205
	OECD Data Point {.....}
	EPA MRID 50621301
	EPA Guideline 850.1350

**Test Material:** Ipconazole TG

**Purity (%):** 96.7%

Common name: Ipconazole

Chemical name: IUPAC: (1RS,2SR,5RS;1RS,2SR,5SR)-2-(4-chlorobenzyl)-5-isopropyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol

CAS name: 2-[(4-chlorophenyl)methyl]-5-(1-methylethyl)-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol

CAS No.: 125225-28-7

Synonyms: None

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*Rebecca L. Bryan*  
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**Date:** 3/4/2019

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**Date:** 04/28/2020  
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**Reference/Submission No.:** {.....}

**Company Code:** {.....} [For PMRA]  
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**EPA PC Code:** 125618

**Date Evaluation Completed:** 01-04-2020

**CITATION:** Hicks, S. 2018. Ipconazole: Life-Cycle Toxicity Test of the Saltwater Mysid, *Americamysis bahia*, Conducted under Flow-Through Conditions. Unpublished study performed by EAG Laboratories, Analytical Bio-Chemistry Laboratories, Inc. (a wholly owned subsidiary of EAG, Inc.), Columbia, Missouri. Laboratory Report No.: 85888. Study sponsored by Kureha Corporation, Tokyo, Japan. Study initiated July 13, 2017 and completed July 6, 2018.

*This Data Evaluation Record may have been altered by the Environmental Fate and Effects Division subsequent to signing by CDM/CSS-Dynamac JV personnel. The CDM/CSS-Dynamac Joint Venture role does not include establishing Agency policies.*

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## **EXECUTIVE SUMMARY:**

The 28-day chronic toxicity of Ipconazole TG to mysids (*Americamysis bahia*) was studied under flow-through conditions. Mysids were exposed to nominal concentrations of 0 (negative and solvent control), 0.0050, 0.010, 0.020, 0.040, 0.080, and 0.16 mg ai/L. The mean-measured concentrations were <0.00044 (<MQL, controls), 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L (with coefficients of variation ranging from 4 to 9%).

Significant treatment-related effects were observed for all endpoints (except F<sub>1</sub> survival). The most sensitive endpoints were F<sub>0</sub> length (female and male), resulting in an overall NOAEC and LOAEC of <0.00393 and 0.00393 mg ai/L, respectively. The NOAEC for the most sensitive endpoints was undefined, as effects were determined in every test level based on Williams' test.

This study is scientifically sound and is classified as acceptable.

## **Results Synopsis**

Test Organism Age(s): Neonates, <24-hours old

Test Type (Flow-through, Static, Static-Renewal): Flow-through

NOAEC: <0.00393 mg ai/L

LOAEC: 0.00393 mg ai/L

Endpoints Affected: All endpoints (except F<sub>1</sub> survival)

Most Sensitive Endpoint: F<sub>0</sub> length (female and male)\*

\* The NOAEC for the most sensitive endpoints was undefined, as effects were determined in every test level based on Williams' test.

## **I. MATERIALS AND METHODS**

### **GUIDELINE FOLLOWED:**

This study was conducted following guidelines outlined in the U.S. Environmental Protection Agency, Ecological Effects Test Guidelines, OPPTS 850.1350 Mysid Chronic Toxicity Test (1996) and intended to comply with U.S. EPA FIFRA Subdivision E, Section 72-4. A deficiency and a deviation from OCSPP 850.1350 were observed.

1. The NOAEC for the most sensitive endpoints (F<sub>0</sub> length (female and male)) was undefined, as effects were determined in every test level based on Williams' test.
2. On Day 28, the dissolved oxygen concentration was <60% saturation in one 0.0330 mg ai/L replicate and all 0.0661 and 0.134 mg ai/L replicates (49-60% saturation). Test solutions were not aerated during the exposure and the delivery rate of fresh test solution during the exposure was maintained at a rate sufficient to replace the test volume approximately 6.7-6.8 times per day, exceeding the five times per day minimum.

The deficiency and deviation do not affect the acceptability of the study.

### **COMPLIANCE:**

Signed and dated GLP, Quality Assurance, and Data Confidentiality claims statements were provided. This study was conducted in accordance with U.S. EPA GLP Standards as published in 40 CFR Part 160 with the following exceptions: routine feed and water characterizations were not performed in accordance with the stated GLP, but this did not adversely affect the study integrity or the interpretation of the study results.

### **A. MATERIALS:**

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<b>1. Test material:</b>	Ipconazole TG
<b>Description:</b>	Not reported
<b>Lot No./Batch No.:</b>	89010
<b>Purity:</b>	96.7% (containing 89.7% Ipconazole cc and 7.0% Ipconazole ct)
<b>Stability of compound under test conditions:</b>	Analytical verification yielded recoveries ranging from 68 to 89% of the nominal concentrations across all sampling times and test concentrations. The reviewer-calculated coefficient of variation (%CV) ranged from 4 to 9%.
<b>Storage conditions of test chemicals:</b>	Room temperature.

## Physicochemical properties of Ipconazole.

Parameter	Values	Comments
Water solubility at 20°C	Not reported	
Vapor pressure	Not reported	
UV absorption	Not reported	
pKa	Not reported	
Kow	Not reported	

## 2. Test organism:

<b>Species:</b>	Saltwater mysid ( <i>Americamysis bahia</i> )
<b>Age class/Age:</b>	Neonates, <24-hours old
<b>Source:</b>	In-house cultures

## B. STUDY DESIGN:

### 1. Experimental Conditions:

a. Range-finding study: A 21-day range-finding test was conducted at nominal concentrations of 0 (negative control), 0 (solvent control, 10 µL DMF/L), 0.020, 0.040, 0.080, 0.16, 0.32, and 0.64 mg ai/L using flow-through conditions (15 mysids/replicate; 30 mysids/group). After 21 days, survival was 87, 83, 77, 73, 77, 82, 73, and 0% in the negative control, solvent control, 0.020, 0.040, 0.080, 0.16, 0.32, and 0.64 mg ai/L groups, respectively. The average number of young per female after 21 days of exposure was 13.4, 9.9, 7.9, 11.4, 6.3, 1.1, 0, and 0 in the negative control, solvent control, 0.020, 0.040, 0.080, 0.16, 0.32, and 0.64 mg ai/L groups, respectively. The average body length of males after 21 days of exposure was 5.65, 5.43, 5.37, 5.44, 5.33, 4.88, and 4.37 in the negative control, solvent control, 0.020, 0.040, 0.080, 0.16 and 0.32 mg ai/L groups, respectively. The average body length of females after 21 days of exposure was 5.98, 5.68, 5.59, 5.61, 5.43, 5.59, and 4.73 in the negative control, solvent control, 0.020, 0.040, 0.080, 0.16, and 0.32 mg ai/L groups, respectively. On Day 20, measured concentrations in samples collected from the

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nominal 0.020, 0.080, and 0.32 mg ai/L groups ranged from 54 to 60% of the nominal concentrations, while the diluter stock solution (64,000 mg ai/L) was 107% of the nominal concentration. The definitive test concentrations were based on these range-finding test results.

b. Definitive Study: Test dates were October 20, 2017 to November 17, 2017

**Table 1: Experimental Parameters**

Parameter	Details	Remarks
		Criteria
<u>Acclimation</u>		
Period:	Continuous culture	<i>EPA recommends within a 24-h period, changes in temperature should be <math>\leq 1^{\circ}\text{C}</math> and changes in salinity be <math>\leq 5\%</math>.</i>
Conditions: (same as test or not)	Same as test (artificial saltwater, salinity of 20 ppt, and temperature of $\sim 25^{\circ}\text{C}$ ).	<i>Mysids should be cultured and tested in dilution water from the same origin.</i>
Feeding:	Mysids were fed enriched brine shrimp nauplii ( <i>Artemia</i> sp. <48 hours old) and a dry larval diet (Larva Z Plus; Zeigler Bros., Inc., Gardners, Pennsylvania)	<i>Mysids should be fed daily during testing, as necessary to support survival, growth and reproduction. <i>Artemia</i> spp. (48-h-old nauplii) is recommended.</i>
Health: (any mortality observed)	The culture health/condition and any mortality were not addressed.	
Duration of the test:	28 days	
Time of pairing:	Pairing on Day 12	<i>The recommended test duration is 28 days. Pairing occurs when mysids reach sexual maturity. Length should be measured at the time of sexual discernment.</i>
<u>Test condition</u>		
Flow-through:	Flow-through	
Type of dilution system - for flow-through method:	Intermittent proportional diluter system, providing test solution at flow rates of <i>ca.</i> 6.7-6.8 volume additions/24 hours.	The accuracy of the delivery of the test solution to the test chambers was verified by volumetric measurement before exposure initiation and adjusted such that the delivered volume was within $\pm 10\%$ of the target volume. The flow of dilution water and proper operation of the proportional diluter and all mechanical systems were verified twice each day during the definitive test with the exception of day 28 (test termination) when only one verification was performed. Operation of the diluter system and delivery of the test substance was initiated seven days prior to the start of the exposure.

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Parameter	Details	Remarks
		Criteria
		<p><i>EPA recommends flow-through systems.</i></p> <p><i>For flow-through tests, the flow rate should be <math>\geq 5</math> vol/24 hours; diluter systems should be calibrated before each test and checked twice daily during the test. Flow rates should not vary by <math>&gt;10\%</math> within and between replicates.</i></p> <p><i>A reproducible supply of toxicant is recommended.</i></p>
Aeration, if any:	No aeration during testing.	<p><i>EPA recommends if aeration is needed to achieve DO level, it should be done before the addition of the test substance, and all treatment and control chambers should be given the same aeration treatment.</i></p>

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Parameter	Details	Remarks
		Criteria
<u>Test vessel</u>		
<u>Test Chambers</u> Material: (glass/stainless steel)	Glass aquaria	<i>EPA recommends materials/equipment that have minimal sorption of test chemicals from dilution water and contain no substances that can be leached and affect test results.</i>
Size:	20 cm wide x 38.5 to 77 cm long x 21 cm high	<i>Test vessels should be loosely covered.</i>
Fill volume:	10 to 20 L (13 cm depth)	
<u>Retention Chambers</u> Material:	Glass Petri dish with stainless-steel screen collar (381 µm mesh opening)	<i>EPA recommends that mysids be held in retention chambers within test chambers to facilitate observations and eliminate loss through outflow water; netting material should be of appropriate mesh size.</i>
Size:	1.5 x 15 cm base for growth and reproduction baskets (1.5 x 10 cm base for adult brood baskets)	
Source of dilution water:	Laboratory saltwater was prepared by adding a commercial sea salt mix (Crystal Sea Marinemix; Marine Enterprises International, Inc., Baltimore, Maryland) to laboratory freshwater. The laboratory freshwater was well water demineralized by reverse osmosis. Prior to use, the dilution water was heated, aerated, passed through a 1 µm filter, and UV-sterilized.	None of the screened contaminants were detected at concentrations that are considered toxic in the analyzed salt water (November 2017).
<u>Quality of dilution water</u>		<i>Recommended source of dilution water is natural or artificial seawater that mysids will survive and successfully reproduce in for the duration of the holding, acclimating, and testing periods without showing signs of stress. Prior to use, natural seawater should be filtered through a &gt;20 µm filter. Deionized water with a conductivity &lt;0.1 mS/m (1µohm/cm) at 12°C is acceptable for making artificial seawater. If ground or surface water was used to make deionized water, then conductivity and TOC (or COD) should be measured on each batch.</i>
Salinity:	20 ± 2‰	
pH:	Not reported	
Specific Conductivity:	Not reported	
TOC:	Not reported	
COD:	Not reported	
Residual Chlorine:	<0.05 mg/L (November 2017)	

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Parameter	Details	Remarks
		Criteria
<u>Water quality during testing</u>		<i>EPA Recommendations:</i>
pH:	7.8-8.3	<i>Dissolved Oxygen: 60-105% saturation</i>
Dissolved oxygen:	Days 0, 7, 14, and 21: 4.5-7.4 mg/L (63-103% saturation) Day 28: 3.5-7.1 mg/L (49-99% saturation)	<i>Temperature: 25 ±°C</i> <i>Salinity: 20±3 %o.</i>
Temperature:	24.1-25.5°C	<i>Photoperiod: 14-h light and 10-h dark, with a 15 to 30 min transition period.</i>
Salinity:	18.8-20.5‰	<i>pH, DO, temperature, and salinity should be measured weekly in each test chamber.</i>
<u>Other measurements</u>		
Photoperiod:	14 hours light:10 hours dark with 30-minute transition periods	
Light intensity:	418-575 lux	
<u>Intervals of water quality measurement</u>	Temperature, pH, and dissolved oxygen were measured in all replicates at test initiation and termination and at least weekly during the definitive test. Salinity was also measured daily in a single test chamber during the definitive test starting with control replicate A, followed by the remaining control chambers, and then proceeding through the test substance treatment chambers. Temperature was also recorded continuously in a centrally located test chamber using an electronic data-logging system.	
<u>Number of replicates:</u>		
<u>Pre-pairing:</u>		
Negative control:	3	<i>A minimum of two replicates per treatment level and control.</i>
Solvent control:	3	
Treatments:	3	
<u>Post-pairing:</u>		
Negative control:	3	
Solvent control:	3	
Treatments:	3	

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Parameter	Details	Remarks
		Criteria
<u>Number of organisms per replicate:</u> <u>Pre-pairing:</u> Negative control: Solvent control: Treatments:	15 15 15	After pairing, each replicate contained 7 pairs (1 male:1 female) of mysids.  For the F1 generation, each replicate compartment contained 15 offspring (with exception of 16 offspring in one negative control replicate and 11-12 offspring in two of the 0.134 mg ai/L replicates).
<u>Post-pairing:</u> Negative control: Solvent control: Treatments:	14 14 14	<i>A minimum of 40 mysids per concentration should be exposed, and physically separated into replicate groups of no more than 8 individuals when most of the mysids reach sexual maturity (usually 10–14 days after the beginning of the test).</i>  <i>Test organisms should be impartially distributed to show no significant bias from the distributions.</i>
Biomass loading rate	Not reported	<i>The number of mysids placed in a test solution should not be so great as to affect results of the test. The loading should not cause DO to fall below the recommended levels.</i>
<u>Test concentrations:</u> Nominal:  Measured:	0 (negative and solvent control), 0.0050, 0.010, 0.020, 0.040, 0.080, and 0.16 mg ai/L  <0.00044 (<MQL, controls), 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L	<i>EPA recommends a minimum of 5 test concentrations, in geometric series with a ratio of 1.5 to 2, plus a control/solvent control.</i>  <i>Test concentration must be measured at each test concentration level at test initiation and on days 7, 14, 21 and 28, and after every malfunction in the appropriate chamber.</i>  <i>Measured concentration of test substance should not vary &gt;20% among replicate test chambers.</i>
Solvent (type, percentage, if used)	DMF; 20 µL/L	<i>The solvent should not exceed 0.1 ml/L.</i>

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Parameter	Details	Remarks
		Criteria
Feeding	Mysids were fed <i>ad libitum</i> brine shrimp nauplii ( <i>Artemia</i> sp.; 24-48 hours old) three times daily, with the exception of the first and last days of the study when mysids were fed twice and once, respectively. The food stock was enriched the day of use with a mixture of Easy DHA Selco, AlgaMac-3050, and AlgaMac-Enhance.	<i>Mysids should be fed daily during testing, as necessary to support survival, growth and reproduction. Artemia spp. (48-h-old nauplii) is recommended.</i>
<u>G<sub>2</sub> exposure</u>	Not reported	
Recovery of chemical	68-89% of nominal	Recoveries based on mean measured concentrations. The reviewer-calculated %CV ranged from 4 to 9%.
Frequency of determination	0, 7, 14, 21, and 28 days	
Level of quantization	MQL = 0.000400 mg Ipconazole cc/L and 0.0000400 mg Ipconazole ct/L	
Level of detection	Not reported	
Positive control {if used, indicate the chemical and concentrations}	None reported	
Other parameters, if any	None	

**2. Observations:**

**Table 2: Observations**

Parameter	Details	Remarks
		Criteria
Parameters measured including the sublethal effects/toxicity symptoms	- F <sub>0</sub> survival - F <sub>0</sub> length and dry weight - Day of first brood - Mean total young per F <sub>0</sub> female - F <sub>1</sub> survival	<i>Recommended parameters measured include:</i> - survival of first generation mysids (F <sub>0</sub> ) pre- and post-pairing; - number of offspring produced per female; - time to sexual discernment; - time to first brood; - body length and dry weight of females, and body length and dry weight of males (F <sub>0</sub> ) (body length is measured by total midline body length, from the anterior tip of the carapace to the posterior margin of the uropod) - survival of offspring (F <sub>1</sub> ); - incidence and description of morphological abnormalities and behavioral effects; - observations of other effects or clinical signs.

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Parameter	Details	Remarks
		Criteria
Observation intervals	F <sub>0</sub> Survival-Days 0, 7, 12, 14, 21, and 28  F <sub>0</sub> Length and Dry Weight- Day 28  Reproduction- Daily  F <sub>1</sub> Survival- Day 10	<i>Mortality and other observations should be recorded at test initiation and on day 7, 14, 21 and 28. The number of male and female mysids in each test chamber should be recorded at the time when sexual characteristics become discernible. Observation of male and female body lengths and dry weights should be conducted on day 28 of the test. As offspring are produced, the young should be counted and separated into retention chambers at the same test substance concentration as the chambers where they originated.</i>
Were raw data included?	Yes	
Other observations, if any	None	

**II. RESULTS AND DISCUSSION:**

**A. MORTALITY AND SUB-LETHAL EFFECTS:**

At 28 days, F<sub>0</sub> survival was 77, 92, 64, 67, 56, and 76% in the mean-measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 91% in the negative control and 92% in the solvent control. Survival at 28 days was significantly reduced in the ≥0.0164 mg ai/L groups. Based on F<sub>0</sub> survival at 28 days, the NOAEC was 0.00745 mg ai/L and the LOAEC was 0.0164 mg ai/L.

The F<sub>0</sub> male body lengths at 28 days were 5.65, 5.54, 5.56, 5.31, 5.22, and 4.59 mm in the mean measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 5.84 mm in the negative control and 5.70 mm in the solvent control. The F<sub>0</sub> female body lengths at 28 days were 5.92, 5.95, 5.97, 5.93, 5.52, and 4.92 mm in the mean measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 6.24 mm in the negative control and 6.16 mm in the solvent control. Growth was significantly reduced in the ≥0.0330 mg ai/L groups for F<sub>0</sub> male mysids and ≥ 0.0661 mg ai/L groups for F<sub>0</sub> female mysids. Based on growth (length) at 28 days, the NOAEC was 0.0164 mg ai/L and the LOAEC was 0.0330 mg ai/L for male mysids.

**Table 3. Effect of Ipconazole TG on Survival and Growth of Adult Mysid sp. <sup>a</sup>**

Mean Measured (Nominal) Concentration (mg ai/L)	Percent Survival (mean)				Growth (mean ± SD)	
	Day 7	Day 12	Day 21	Day 28	F <sub>0</sub> Total Body Length (mm); Day 28	
					Male	Female
Negative Control (<MQL)	96	93	95	91	5.84 ± 0.0529	6.24 ± 0.191
Solvent Control (<MQL)	91	89	95	92	5.70 ± 0.197	6.16 ± 0.0492

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Mean Measured (Nominal) Concentration (mg ai/L)	Percent Survival (mean)				Growth (mean ± SD)	
	Day 7	Day 12	Day 21	Day 28	F <sub>0</sub> Total Body Length (mm); Day 28	
					Male	Female
Pooled Control	93	91	95	92	5.77 ± 0.150	6.20 ± 0.131
0.00393 (0.0050)	100	91	90	77	5.65 ± 0.0502	5.92 ± 0.0802 <sup>b</sup>
0.00745 (0.010)	96	84	98	92	5.54 ± 0.0523 <sup>b</sup>	5.95 ± 0.0842 <sup>b</sup>
0.0164 (0.020)	96	93	81	64*	5.56 ± 0.115 <sup>b</sup>	5.97 ± 0.0174 <sup>b</sup>
0.0330 (0.040)	93	82	90	67*	5.31 ± 0.102*	5.93 ± 0.234 <sup>b</sup>
0.0661 (0.080)	96	84	98	56*	5.22 ± 0.189*	5.52 ± 0.155*
0.134 (0.16)	100	91	98	76*	4.59 ± 0.117*	4.92 ± 0.207*
NOAEC	0.134	0.134	0.134	0.00745	0.0164	0.0330
LOAEC	>0.134	>0.134	>0.134	0.0164	0.0330	0.0661

a Data were obtained from Tables 3-4 and 6 on pages 35-37 and 40-41 of the study report. Mysid counts used for survival percent calculations exclude mysid mortalities not related to treatment (inadvertently injured during the study or had become impinged and died).

b Statistically significant reduction (Dunnett's and/or Williams' Tests;  $p = 0.05$ ) in treatment length as compared to the pooled control, however, <5% difference compared to pool control. Therefore, not considered to be biologically significant.

\* There was a statistically significant reduction (Dunnett's, Fisher's, or Williams' Tests,  $p = 0.05$ ) in treatment survival as compared to the pooled control.

MQL= 0.000400 mg Ipconazole cc/L and 0.0000400 mg Ipconazole ct/L

**B. EFFECT ON REPRODUCTION:** Time to first brood was 16.2, 15.9, 15.4, 15.6, 16.5, and 19.3 days in the mean measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 15.7 days in the negative control and 15.4 days in the solvent control. Significantly increased time to first brood was observed in the ≥0.0661 mg ai/L groups. Based on time to first brood, the NOAEC was 0.0330 mg ai/L and the LOAEC was 0.0661 mg ai/L.

Reproduction, as mean offspring per female, was 27.8, 29.6, 22.4, 26.3, 16.4 and 1.95 in the mean measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 27.9 in the negative control and 34.2 in the solvent control. Based on reproduction, the NOAEC was 0.0330 mg ai/L and the LOAEC was 0.0661 mg ai/L.

At 10 days, F<sub>1</sub> survival was 100, 93, 91, 100, 87, and 79% in the mean measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 98% in both the negative and solvent controls. The F<sub>1</sub> survival was significantly reduced in the ≥0.0661 mg ai/L groups. Based on F<sub>1</sub> survival at 10 days, the NOAEC was 0.0330 mg ai/L and the LOAEC was 0.0661 mg ai/L.

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**Table 4. Effect of Ipconazole on Reproduction of Adult and Survival of Young Mysid sp. <sup>a</sup>**

Mean Measured (Nominal) Concentration (mg ai/L)	Mean Time to First Brood (Days)	Reproduction (mean ± SD)	Percent Survival of Offspring (mean)	F <sub>1</sub> Total Body Length (mean ± SD); Day 10 (mm)	
		Mean Offspring per Female	Day 10	Male	Female
Negative Control (<MQL)	15.7	27.9 ± 4.70	98	4.67 ± 0.113	4.76 ± 0.247
Solvent Control (<MQL)	15.4	34.2 ± 4.72	98	4.65 ± 0.0615	4.73 ± 0.0837
Pooled Control	15.6	31.1 ± 5.46	98	4.66 ± 0.0818	4.74 ± 0.166
0.00393 (0.0050)	16.2	27.8 ± 5.24	100	4.60 ± 0.0809	4.72 ± 0.0238
0.00745 (0.010)	15.9	29.6 ± 6.57	93	4.62 ± 0.0929	4.77 ± 0.0380
0.0164 (0.020)	15.4	22.4 ± 6.55	91	4.65 ± 0.133	4.83 ± 0.129
0.0330 (0.040)	15.6	26.3 ± 11.1	100	4.52 ± 0.133	4.65 ± 0.223
0.0661 (0.080)	16.5*	16.4 ± 5.83*	87*	4.47 ± 0.154	4.71 ± 0.224
0.134 (0.16)	19.3*	1.95 ± 0.541*	79*	3.55 ± 0.230*	3.70 ± 0.429*
NOAEC	0.0330	0.0330	0.0330	0.0661	0.0661
LOAEC	0.0661	0.0661	0.0661	0.134	0.134

<sup>a</sup> Data were obtained from Tables 7-10 on pages 42-48 of the study report.

\* There was a statistically significant reduction (Dunnett's, Williams', and/or Fisher's Tests;  $p = 0.05$ ) in treatment mean as compared to the pooled control.

MQL= 0.000400 mg Ipconazole cc/L and 0.0000400 mg Ipconazole ct/L

The F<sub>1</sub> male body lengths at 10 days were 4.60, 4.62, 4.65, 4.52, 4.47, and 3.55 mm in the mean measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 4.67 mm in the negative control and 4.65 mm in the solvent control. The F<sub>1</sub> female body lengths at 10 days were 4.72, 4.77, 4.83, 4.65, 4.71, and 3.70 mm in the mean measured 0.00393, 0.00745, 0.0164, 0.0330, 0.0661, and 0.134 mg ai/L groups, respectively, compared to 4.76 mm in the negative control and 4.73 mm in the solvent control. Growth for F<sub>1</sub> male and female mysids was significantly reduced in the 0.134 mg ai/L group. Based on F<sub>1</sub> growth (length) at 10 days, the NOAEC was 0.0661 mg ai/L and the LOAEC was 0.134 mg ai/L for male and female mysids.

**C. REPORTED STATISTICS:** All statistical tests were performed using mean-measured concentrations (mg ai/L), and SAS (Version 9.3) statistical software. Prior to comparisons of the treatment groups to the control group, the negative control and vehicle control were compared using a two-tailed Fisher's exact test and a two tailed t-test means comparison based on a one-way analysis of variance (ANOVA) including all treatment groups. The reproductive and growth parameters control means were compared using a two-tailed t-test means

# Data Evaluation Report on the Chronic Toxicity of Ipconazole TG to Mysids (*Americamysis bahia*)

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comparison based on ANOVA including all treatment groups. Since there no statistical difference between the control and vehicle control for survival, reproduction, and growth (length) data, statistical comparisons were made against the pooled controls.

For survival, the no-observed-effect concentration (NOEC) was determined using Fisher's test and estimated using one-tailed Dunnett's and Williams' tests. Prior to the Dunnett's test, the Shapiro Wilk's test for normality ( $p=0.01$ ) and Levene's test for homogeneity of variance ( $p=0.01$ ) were conducted. The assumptions of normality and homogeneity of variance were not met for the F<sub>0</sub> 7-, 14-, 21-, and 28-day survival data and the F<sub>1</sub> survival data, and these parameters were analyzed with a non-parametric ANOVA and Dunnett's test on the transformed data (i.e., ranks). The F<sub>0</sub> survival data on Day 12 were analyzed with a parametric ANOVA and Dunnett's and Williams' tests on non-transformed data.

For growth as body length, time to first brood release, and number of young per female endpoints, the NOEC was estimated using parametric ANOVA procedure and a one-tailed Dunnett's test and Williams' test with the alternate hypothesis being the parameter mean was reduced (length and young per female) or increased (time to first brood) in comparison to the pooled control mean. Prior to the Dunnett's and Williams' test, the Shapiro Wilk's test for normality and Levene's test for homogeneity of variance were conducted over treatments at each time point. The assumptions of normality and homogeneity of variance were met for the Day 14- and Day-28 F<sub>0</sub>-female and -male length data, the Day 10 F<sub>1</sub>-male length data, and mean number of young per female data; therefore, these parameters were analyzed with a parametric ANOVA, Dunnett's, and Williams' tests on the raw data. The assumptions of normality and homogeneity of variance were not met for the Day 10 F<sub>1</sub>-female length data, or the time to first brood data, therefore, these parameters were analyzed with a non-parametric ANOVA, Dunnett's, and Williams' tests on the transformed data (i.e., ranks).

The point estimates of the maximum acceptable toxicant concentration (MATC) were calculated as the geometric mean of the NOEC and LOEC values of the biological endpoints. The LC<sub>50</sub> was empirically estimated because the F<sub>0</sub> and F<sub>1</sub> mortality did not exceed 50% at any of the time points.

## Pre-Pairing Survival (12-day)

NOAEC: 0.134 mg ai/L  
LOAEC: >0.134 mg ai/L

## Post-Pairing Survival (28-day)

NOAEC: 0.00745 mg ai/L  
LOAEC: 0.0164 mg ai/L

## F<sub>0</sub> Length-Male (28-day)

NOAEC: 0.0164 mg ai/L  
LOAEC: 0.0330 mg ai/L

## F<sub>0</sub> Length-Female (28-day)

NOAEC: 0.0330 mg ai/L  
LOAEC: 0.0661 mg ai/L

## Day to First Brood

NOAEC: 0.0330 mg ai/L  
LOAEC: 0.0661 mg ai/L

## Reproduction (offspring/female)

NOAEC: 0.0330 mg ai/L  
LOAEC: 0.0661 mg ai/L

## F<sub>1</sub> Offspring Survival (10-day)

NOAEC: 0.0330 mg ai/L  
LOAEC: 0.0661 mg ai/L

# Data Evaluation Report on the Chronic Toxicity of Ipconazole TG to Mysids (*Americamysis bahia*)

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## F<sub>1</sub> Length-Male (10-day)

NOAEC: 0.0661 mg ai/L

LOAEC: 0.134 mg ai/L

## F<sub>1</sub> Length-Female (10-day)

NOAEC: 0.0661 mg ai/L

LOAEC: 0.134 mg ai/L

Endpoints Affected: All endpoints (except pre-pairing survival)

Most Sensitive Endpoint: Post-pairing survival

## **D. VERIFICATION OF STATISTICAL RESULTS:**

Statistical Method: The reviewer analyzed the study endpoints using CETIS statistical software version 1.9.5.3 with database backend settings implemented by EFED on 7/25/2017. The negative and solvent control data were compared using an Equal or Unequal Variance t Two-Sample test, and no significant differences were determined. The reviewer used the negative control for all subsequent analyses.

Data were tested for normality using Shapiro-Wilk's test ( $\alpha = 0.01$ ) and for homogeneity of variance using Bartlett's or Levene's test ( $\alpha = 0.01$ ).

The F<sub>0</sub> pre-pairing survival and time to first brood endpoints did not met these assumptions and were analyzed using the non-parametric Mann-Whitney U two-sample test.

All other endpoints met the assumptions and were therefore analyzed using analysis of variance followed by the parametric Dunnett's (post-pairing survival, no. offspring/female, F<sub>1</sub> offspring survival, and F<sub>1</sub> female and male length) or Williams' multiple comparison test (female and male F<sub>0</sub> length). All analyses were conducted  $\alpha = 0.05$  unless specified otherwise, and all toxicity values are based on the mean-measured concentrations.

## Pre-Pairing Survival (12-day, except 14-day for 0.134 mg ai/L treatment due to delay in development)

NOAEC: 0.0661 mg ai/L

LOAEC: 0.134 mg ai/L

## Post-Pairing Survival (28-day)

NOAEC: 0.0330 mg ai/L

LOAEC: 0.0661 mg ai/L

## F<sub>0</sub> Length-Female (28-day)

NOAEC: <0.00393 mg ai/L

LOAEC: 0.00393 mg ai/L

## F<sub>0</sub> Length-Male (28-day)

NOAEC: <0.00393 mg ai/L

LOAEC: 0.00393 mg ai/L

## Time to First Brood

NOAEC: 0.0661 mg ai/L

LOAEC: 0.134 mg ai/L

## Reproduction (offspring/female)

NOAEC: 0.0661 mg ai/L

LOAEC: 0.134 mg ai/L

## F<sub>1</sub> Offspring Survival (10-day)

NOAEC: 0.134 mg ai/L

# Data Evaluation Report on the Chronic Toxicity of Ipconazole TG to Mysids (*Americamysis bahia*)

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LOAEC: >0.134 mg ai/L

## F<sub>1</sub> Length-Female (10-day)

NOAEC: 0.0661 mg ai/L

LOAEC: 0.134 mg ai/L

## F<sub>1</sub> Length-Male (10 day)

NOAEC: 0.0661 mg ai/L

LOAEC: 0.134 mg ai/L

Endpoints Affected: All endpoints (except F<sub>1</sub> survival)

Most Sensitive Endpoint: F<sub>0</sub> length (female and male)\*

\* The NOAEC for the most sensitive endpoints was undefined, as effects were determined in every test level based on Williams' test.

## **E. STUDY DEFICIENCIES:**

The NOAEC for the most sensitive endpoints was undefined, as effects were determined in every test level based on Williams' test.

## **F. REVIEWER'S COMMENTS:**

The reviewer's and the study author's results differed for multiple endpoints, which is due to the study author transforming data that did not meet the assumptions of ANOVA and comparing the exposure groups to the pooled controls. The reviewer's results are presented in the Executive Summary and Conclusions sections of this DER.

On Day 28, the dissolved oxygen concentration was <60% saturation in one 0.0330 mg ai/L replicate and all 0.0661 and 0.134 mg ai/L replicates (49-60% saturation). Test solutions were not aerated during the exposure and the delivery rate of fresh test solution during the exposure was maintained at a rate sufficient to replace the test volume approximately 6.7-6.8 times per day, exceeding the five times per day minimum.

The in-life phase of the test was conducted from October 20, 2017 to November 17, 2017.

**G. CONCLUSIONS:** This study is **scientifically sound** and is classified as **acceptable**. Significant treatment-related effects were observed for all endpoints (except F<sub>1</sub> survival). The most sensitive endpoints were F<sub>0</sub> length (female and male), resulting in an overall NOAEC and LOAEC of <0.00393 and 0.00393 mg ai/L, respectively. The NOAEC for the most sensitive endpoints was undefined, as effects were determined in every test level based on Williams' test.

## **III. REFERENCES:**

None; other than standard guidelines and methodologies.

# CETIS Summary Report

Report Date: 02 Apr-19 19:52 (p 1 of 5)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:
Test Length:	28d 0h	Taxon:		Source: Lab In-House Culture
Sample ID:	02-6858-5282	Code:	50621301	Age:
Sample Date:	20 Oct-17	Material:	Ipconazole	Project: Fungicide
Receipt Date:		CAS (PC):		Source: Kureha Corporation
Sample Age:	n/a	Client:	CDM Smith - M. Wright	Station:

125618 50621301 - mean-measured concentrations  
 for F0 male and female dry weight used for F1 gen male and female length data, respectively Columns

## Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-5760-9659	F0 Female Dry Weight	Equal Variance t Two-Sample Test	0.8348	Solvent Blank passed f0 female dry weight	1
11-4452-0993	F0 Female Length	Equal Variance t Two-Sample Test	0.5373	Solvent Blank passed f0 female length	1
03-0362-8369	F0 Male Dry Weight	Equal Variance t Two-Sample Test	0.7683	Solvent Blank passed f0 male dry weight	1
16-1013-1267	F0 Male Length	Equal Variance t Two-Sample Test	0.3057	Solvent Blank passed f0 male length	1
07-6916-1740	F0 Survival Post Pairing	Equal Variance t Two-Sample Test	0.9526	Solvent Blank passed f0 survival post pairi	1
05-8172-1073	F0 Survival Pre Pairing	Unequal Variance t Two-Sample Test	0.5286	Solvent Blank passed f0 survival pre pairin	1
08-5293-4373	F1 Survival	Unequal Variance t Two-Sample Test	0.9665	Solvent Blank passed f1 survival	1
19-1586-0273	n Offpspring Per Female	Equal Variance t Two-Sample Test	0.1776	Solvent Blank passed n offpspring per fem	1
14-8479-3163	Time to First Brood	Equal Variance t Two-Sample Test	0.2464	Solvent Blank passed time to first brood	1

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
11-2247-3427	F0 Female Dry Weight	Dunnett Multiple Comparison Test	0.0661	0.134	0.09411		9.92%	1
01-2943-5341	F0 Female Dry Weight	Williams Multiple Comparison Test	0.0661	0.134	0.09411		7.46%	1
08-5839-4883	F0 Female Length	Dunnett Multiple Comparison Test	0.033	0.0661	0.0467		5.22%	1
04-0060-9763	F0 Female Length	Williams Multiple Comparison Test	✓ <0.00393	0.00393	n/a		3.93%	1
09-2745-6548	F0 Male Dry Weight	Dunnett Multiple Comparison Test	0.0661	0.134	0.09411		6.2%	1
17-0709-3237	F0 Male Dry Weight	Williams Multiple Comparison Test	0.0661	0.134	0.09411		4.66%	1
08-9224-1878	F0 Male Length	Dunnett Multiple Comparison Test	0.00393	0.00745	0.005411		3.81%	1
19-7829-1663	F0 Male Length	Williams Multiple Comparison Test	✓ <0.00393	0.00393	n/a		2.87%	1
16-1424-9454	F0 Survival Post Pairing	Dunnett Multiple Comparison Test	0.033	0.0661	0.0467		32.7%	1
04-3512-3025	F0 Survival Post Pairing	Williams Multiple Comparison Test	0.00745	0.0164	0.01105		24.6%	1
18-1840-7952	F0 Survival Pre Pairing	Jonckheere-Terpstra Step-Down Test	0.0661	0.134	0.09411		n/a	1
01-4790-5368	F0 Survival Pre Pairing	Mann-Whitney U Two-Sample Test	0.0661	0.134	0.09411		15.3%	1
20-3713-2823	F1 Survival	Dunnett Multiple Comparison Test	0.134	>0.134	n/a		16.2%	1
13-8736-5062	F1 Survival	Williams Multiple Comparison Test	0.0661	0.134	0.09411		12.2%	1
05-8411-6224	n Offpspring Per Female	Dunnett Multiple Comparison Test	0.0661	0.134	0.09411		47.9%	1
20-6848-0702	n Offpspring Per Female	Williams Multiple Comparison Test	0.033	0.0661	0.0467		36.0%	1
00-7237-8470	Time to First Brood	Jonckheere-Terpstra Step-Down Test	0.0661	0.134	0.09411		n/a	1
21-2388-3553	Time to First Brood	Mann-Whitney U Two-Sample Test	0.0661	0.134	0.09411		10.6%	1

**CETIS Summary Report**

 Report Date: 02 Apr-19 19:52 (p 2 of 5)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

**OPPTS 850.1350 Chronic Invert (Mysid)**
**EAG (ABC Lab)**
**F0 Female Dry Weight Summary**

<b>Conc-mg ai/L</b>	<b>Code</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>%Effect</b>
0	S	3	4.73	4.52	4.93	4.67	4.82	0.047	0.0814	1.72%	0.00%
0	N	3	4.76	4.15	5.37	4.5	4.99	0.142	0.246	5.18%	-0.71%
0.00393		3	4.72	4.67	4.78	4.7	4.74	0.012	0.0208	0.44%	0.07%
0.00745		3	4.77	4.68	4.87	4.73	4.8	0.0219	0.0379	0.79%	-0.99%
0.0164		3	4.83	4.5	5.16	4.68	4.91	0.0767	0.133	2.75%	-2.26%
0.033		3	4.66	4.1	5.21	4.46	4.9	0.129	0.224	4.80%	1.48%
0.0661		3	4.71	4.16	5.26	4.47	4.91	0.129	0.223	4.73%	0.35%
0.134		3	3.7	2.63	4.77	3.21	4	0.248	0.43	11.62%	21.65%

**F0 Female Length Summary**

<b>Conc-mg ai/L</b>	<b>Code</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>%Effect</b>
0	S	3	6.16	6.04	6.29	6.13	6.22	0.0285	0.0493	0.80%	0.00%
0	N	3	6.24	5.77	6.71	6.02	6.36	0.11	0.191	3.06%	-1.24%
0.00393		3	5.92	5.72	6.12	5.84	6	0.0463	0.0802	1.35%	3.89%
0.00745		3	5.95	5.75	6.16	5.86	6.02	0.0481	0.0833	1.40%	3.41%
0.0164		3	5.97	5.93	6.01	5.95	5.98	0.01	0.0173	0.29%	3.14%
0.033		3	5.93	5.35	6.51	5.7	6.17	0.136	0.235	3.97%	3.79%
0.0661		3	5.52	5.13	5.9	5.34	5.63	0.0895	0.155	2.81%	10.49%
0.134		3	4.92	4.4	5.44	4.71	5.13	0.121	0.21	4.27%	20.17%

**F0 Male Dry Weight Summary**

<b>Conc-mg ai/L</b>	<b>Code</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>%Effect</b>
0	S	3	4.65	4.49	4.8	4.58	4.7	0.0353	0.0611	1.31%	0.00%
0	N	3	4.67	4.39	4.95	4.6	4.8	0.0651	0.113	2.41%	-0.50%
0.00393		3	4.59	4.39	4.79	4.52	4.68	0.0467	0.0808	1.76%	1.15%
0.00745		3	4.62	4.4	4.84	4.53	4.71	0.052	0.09	1.95%	0.57%
0.0164		3	4.65	4.33	4.98	4.51	4.77	0.0762	0.132	2.84%	-0.14%
0.033		3	4.52	4.19	4.84	4.38	4.64	0.0754	0.131	2.89%	2.80%
0.0661		3	4.47	4.09	4.85	4.3	4.6	0.0882	0.153	3.42%	3.87%
0.134		3	3.55	2.99	4.12	3.29	3.69	0.132	0.228	6.42%	23.53%

**F0 Male Length Summary**

<b>Conc-mg ai/L</b>	<b>Code</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>%Effect</b>
0	S	3	5.7	5.2	6.2	5.48	5.87	0.115	0.2	3.50%	0.00%
0	N	3	5.84	5.71	5.97	5.8	5.9	0.0306	0.0529	0.91%	-2.46%
0.00393		3	5.65	5.52	5.77	5.6	5.7	0.0291	0.0503	0.89%	0.94%
0.00745		3	5.54	5.41	5.67	5.48	5.58	0.0306	0.0529	0.96%	2.81%
0.0164		3	5.56	5.28	5.85	5.45	5.68	0.0664	0.115	2.07%	2.40%
0.033		3	5.31	5.06	5.56	5.2	5.4	0.0586	0.101	1.91%	6.84%
0.0661		3	5.22	4.75	5.69	5	5.35	0.109	0.189	3.63%	8.48%
0.134		3	4.59	4.3	4.88	4.5	4.72	0.0677	0.117	2.55%	19.53%

**F0 Survival Post Pairing Summary**

<b>Conc-mg ai/L</b>	<b>Code</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>%Effect</b>
0	S	3	0.910	0.658	1.000	0.800	1.000	0.059	0.101	11.14%	0.00%
0	N	3	0.913	0.884	0.943	0.900	0.923	0.007	0.012	1.30%	-0.41%
0.00393		3	0.769	0.196	1.000	0.538	1.000	0.133	0.231	30.00%	15.42%
0.00745		3	0.923	0.732	1.000	0.846	1.000	0.044	0.077	8.33%	-1.49%
0.0164		3	0.638	0.396	0.880	0.538	0.733	0.056	0.098	15.28%	29.83%
0.033		3	0.667	0.115	1.000	0.538	0.923	0.128	0.222	33.31%	26.70%
0.0661		3	0.560	0.513	0.608	0.538	0.571	0.011	0.019	3.40%	38.38%
0.134		3	0.762	0.352	1.000	0.571	0.857	0.095	0.165	21.65%	16.23%

**CETIS Summary Report**

 Report Date: 02 Apr-19 19:52 (p 3 of 5)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

**OPPTS 850.1350 Chronic Invert (Mysid)**
**EAG (ABC Lab)**
**F0 Survival Pre Pairing Summary**

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	0.889	0.636	1.000	0.800	1.000	0.059	0.102	11.46%	0.00%
0	N	3	0.933	0.933	0.933	0.933	0.933	0.000	0.000	0.00%	-5.00%
0.00393		3	0.911	0.658	1.000	0.800	1.000	0.059	0.102	11.18%	-2.50%
0.00745		3	0.844	0.591	1.000	0.733	0.933	0.059	0.102	12.06%	5.00%
0.0164		3	0.933	0.768	1.000	0.867	1.000	0.039	0.067	7.14%	-5.00%
0.033		3	0.822	0.569	1.000	0.733	0.933	0.059	0.102	12.39%	7.50%
0.0661		3	0.844	0.591	1.000	0.733	0.933	0.059	0.102	12.06%	5.00%
0.134		3	0.778	0.682	0.873	0.733	0.800	0.022	0.039	4.95%	12.50%

**F1 Survival Summary**

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	0.978	0.882	1.000	0.933	1.000	0.022	0.039	3.94%	0.00%
0	N	3	0.979	0.890	1.000	0.938	1.000	0.021	0.036	3.69%	-0.14%
0.00393		3	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-2.27%
0.00745		3	0.932	0.766	1.000	0.867	1.000	0.039	0.067	7.16%	4.71%
0.0164		3	0.911	0.658	1.000	0.800	1.000	0.059	0.102	11.18%	6.82%
0.033		3	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-2.27%
0.0661		3	0.867	0.701	1.000	0.800	0.933	0.039	0.067	7.69%	11.36%
0.134		3	0.833	0.475	1.000	0.750	1.000	0.083	0.144	17.32%	14.77%

**n Offspring Per Female Summary**

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	34.2	22.4	46	29.4	38.9	2.74	4.75	13.88%	0.00%
0	N	3	27.9	16.3	39.6	24.6	33.3	2.71	4.69	16.80%	18.40%
0.00393		3	27.8	14.8	40.8	21.9	31.9	3.02	5.24	18.84%	18.79%
0.00745		3	29.6	13.3	45.9	22.6	35.6	3.79	6.57	22.16%	13.44%
0.0164		3	22.4	6.12	38.8	16.7	29.6	3.79	6.57	29.28%	34.47%
0.033		3	26.3	-1.25	53.9	15.4	37.6	6.41	11.1	42.17%	23.08%
0.0661		3	16.4	1.98	30.8	9.71	20.1	3.35	5.81	35.40%	52.08%
0.134		3	1.95	0.605	3.3	1.57	2.57	0.313	0.541	27.77%	94.30%

**Time to First Brood Summary**

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	15.4	15.1	15.8	15.3	15.6	0.0882	0.153	0.99%	0.00%
0	N	3	15.7	14.9	16.6	15.4	16.1	0.203	0.351	2.23%	-1.94%
0.00393		3	16.2	15	17.3	15.9	16.7	0.267	0.462	2.86%	-4.75%
0.00745		3	15.9	14.2	17.6	15.1	16.4	0.393	0.681	4.29%	-2.81%
0.0164		3	15.4	15.1	15.8	15.3	15.6	0.0882	0.153	0.99%	0.00%
0.033		3	15.6	14	17.2	15.1	16.3	0.371	0.643	4.13%	-0.86%
0.0661		3	16.5	15.5	17.5	16.1	16.9	0.233	0.404	2.45%	-6.70%
0.134		3	19.3	13.7	24.9	17	21.5	1.3	2.25	11.68%	-24.84%

**CETIS Summary Report**

**Report Date:** 02 Apr-19 19:52 (p 4 of 5)  
**Test Code/ID:** 125618 50621301 / 00-2088-2028

**OPPTS 850.1350 Chronic Invert (Mysid)****EAG (ABC Lab)****F0 Female Dry Weight Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	4.82	4.69	4.67
0	N	4.99	4.5	4.79
0.00393		4.74	4.73	4.7
0.00745		4.79	4.73	4.8
0.0164		4.91	4.68	4.91
0.033		4.9	4.46	4.61
0.0661		4.91	4.47	4.75
0.134		3.9	4	3.21

**F0 Female Length Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	6.14	6.22	6.13
0	N	6.36	6.02	6.34
0.00393		5.84	6	5.93
0.00745		5.86	6.02	5.98
0.0164		5.98	5.98	5.95
0.033		6.17	5.7	5.92
0.0661		5.63	5.34	5.58
0.134		4.92	5.13	4.71

**F0 Male Dry Weight Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	4.58	4.66	4.7
0	N	4.8	4.6	4.61
0.00393		4.58	4.68	4.52
0.00745		4.71	4.53	4.62
0.0164		4.77	4.51	4.68
0.033		4.64	4.38	4.53
0.0661		4.6	4.3	4.5
0.134		3.69	3.68	3.29

**F0 Male Length Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	5.75	5.87	5.48
0	N	5.8	5.9	5.82
0.00393		5.6	5.7	5.64
0.00745		5.48	5.56	5.58
0.0164		5.68	5.45	5.56
0.033		5.33	5.2	5.4
0.0661		5.3	5	5.35
0.134		4.5	4.72	4.54

**F0 Survival Post Pairing Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	1.000	0.800	0.929
0	N	0.917	0.900	0.923
0.00393		0.538	0.769	1.000
0.00745		1.000	0.846	0.923
0.0164		0.733	0.538	0.643
0.033		0.923	0.538	0.538
0.0661		0.538	0.571	0.571
0.134		0.571	0.857	0.857

**CETIS Summary Report**

**Report Date:** 02 Apr-19 19:52 (p 5 of 5)  
**Test Code/ID:** 125618 50621301 / 00-2088-2028

**OPPTS 850.1350 Chronic Invert (Mysid)****EAG (ABC Lab)****F0 Survival Pre Pairing Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	0.800	1.000	0.867
0	N	0.933	0.933	0.933
0.00393		1.000	0.933	0.800
0.00745		0.933	0.867	0.733
0.0164		1.000	0.867	0.933
0.033		0.733	0.800	0.933
0.0661		0.733	0.867	0.933
0.134		0.800	0.800	0.733

**F1 Survival Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	1.000	1.000	0.933
0	N	0.938	1.000	1.000
0.00393		1.000	1.000	1.000
0.00745		1.000	0.867	0.929
0.0164		0.933	1.000	0.800
0.033		1.000	1.000	1.000
0.0661		0.867	0.933	0.800
0.134		0.750	1.000	0.750

**n Offspring Per Female Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	38.9	29.4	34.4
0	N	25.9	24.6	33.3
0.00393		21.9	31.9	29.6
0.00745		30.7	22.6	35.6
0.0164		21	16.7	29.6
0.033		37.6	15.4	26
0.0661		20.1	9.71	19.4
0.134		2.57	1.71	1.57

**Time to First Brood Detail**

Conc-mg ai/L	Code	Rep 1	Rep 2	Rep 3
0	S	15.4	15.6	15.3
0	N	16.1	15.7	15.4
0.00393		16.7	15.9	15.9
0.00745		16.1	16.4	15.1
0.0164		15.6	15.4	15.3
0.033		15.1	16.3	15.3
0.0661		16.1	16.4	16.9
0.134		17	21.5	19.3

# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 1 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 11-2247-3427 Analyzed: 02 Apr-19 19:47	Endpoint: F0 Female Dry Weight Analysis: Parametric-Control vs Treatments	CETIS Version: CETISv1.9.5 Status Level: 1			
Batch ID: 01-1053-3132 Start Date: 20 Oct-17 Ending Date: 17 Nov-17 Test Length: 28d 0h	Test Type: Chronic Mysid (28-d) Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life Cycle) Species: Americamysis bahia Taxon:	Analyst: Diluent: Laboratory seawater + laboratory fresh Brine: Source: Lab In-House Culture		Age:	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	0.0661	0.134	0.09411	9.92%

## Dunnett Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393	0.197	2.53	0.472	4	CDF	0.7976	Non-Significant Effect
		0.00745	-0.0715	2.53	0.472	4	CDF	0.8754	Non-Significant Effect
		0.0164	-0.393	2.53	0.472	4	CDF	0.9371	Non-Significant Effect
		0.033	0.554	2.53	0.472	4	CDF	0.6585	Non-Significant Effect
		0.0661	0.268	2.53	0.472	4	CDF	0.7728	Non-Significant Effect
		0.134*	5.67	2.53	0.472	4	CDF	1.5E-04	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	2.83318	0.472197	6	9.06	3.7E-04	Significant Effect
Error	0.729733	0.0521238	14			
Total	3.56291		20			

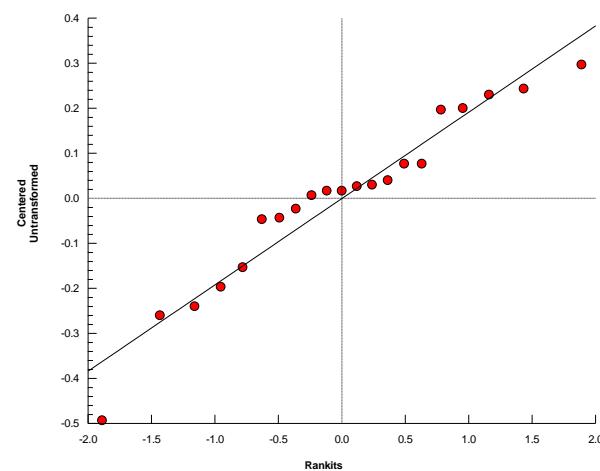
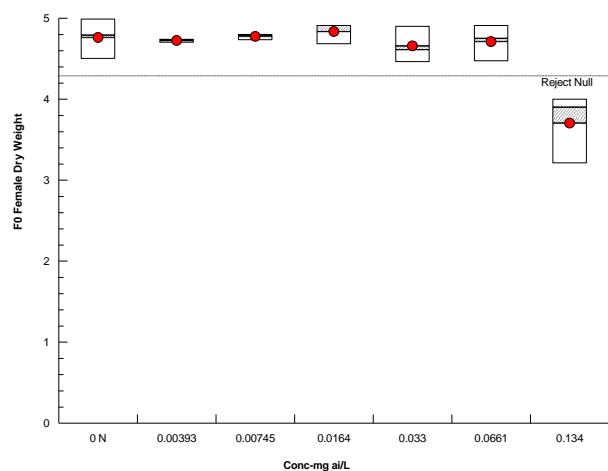
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	13.7	16.8	0.0335	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.944	0.871	0.2627	Normal Distribution

## F0 Female Dry Weight Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	4.76	4.15	5.37	4.79	4.5	4.99	0.142	5.18%	0.00%
0.00393		3	4.72	4.67	4.78	4.73	4.7	4.74	0.012	0.44%	0.77%
0.00745		3	4.77	4.68	4.87	4.79	4.73	4.8	0.0219	0.79%	-0.28%
0.0164		3	4.83	4.5	5.16	4.91	4.68	4.91	0.0767	2.75%	-1.54%
0.033		3	4.66	4.1	5.21	4.61	4.46	4.9	0.129	4.80%	2.17%
0.0661		3	4.71	4.16	5.26	4.75	4.47	4.91	0.129	4.73%	1.05%
0.134		3	3.7	2.63	4.77	3.9	3.21	4	0.248	11.62%	22.20%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 2 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 01-2943-5341	Endpoint: F0 Female Dry Weight	CETIS Version: CETISv1.9.5			
Analyzed: 02 Apr-19 19:47	Analysis: Parametric-Control vs Ord.Treatments	Status Level: 1			
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:			
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh			
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:			
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture		Age:	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	
Untransformed	C > T	0.0661	0.134	0.09411	PMSD 7.46%

## Williams Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393	0.197	1.76	0.328	4	CDF	>0.05	Non-Significant Effect
		0.00745	0.0626	1.85	0.345	4	CDF	>0.05	Non-Significant Effect
		0.0164	-0.0894	1.88	0.35	4	CDF	>0.05	Non-Significant Effect
		0.033	0.554	1.89	0.353	4	CDF	>0.05	Non-Significant Effect
		0.0661	0.411	1.9	0.354	4	CDF	>0.05	Non-Significant Effect
		0.134*	5.67	1.91	0.355	4	CDF	<0.05	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	2.83318	0.472197	6	9.06	3.7E-04	Significant Effect
Error	0.729733	0.0521238	14			
Total	3.56291		20			

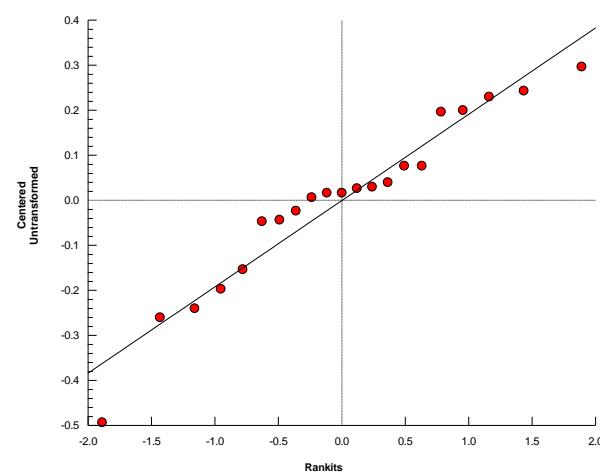
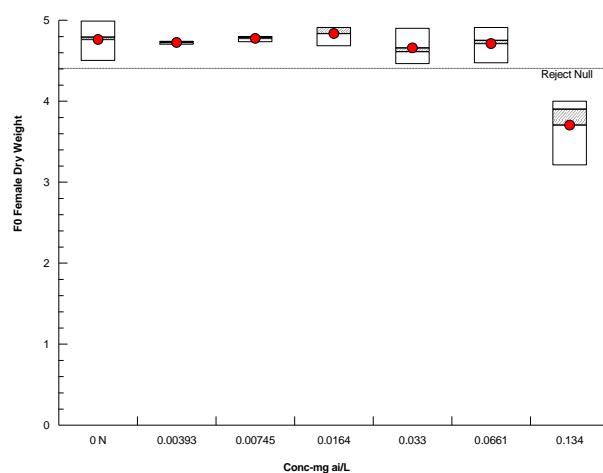
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	13.7	16.8	0.0335	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.944	0.871	0.2627	Normal Distribution

## F0 Female Dry Weight Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	4.76	4.15	5.37	4.79	4.5	4.99	0.142	5.18%	0.00%
0.00393		3	4.72	4.67	4.78	4.73	4.7	4.74	0.012	0.44%	0.77%
0.00745		3	4.77	4.68	4.87	4.79	4.73	4.8	0.0219	0.79%	-0.28%
0.0164		3	4.83	4.5	5.16	4.91	4.68	4.91	0.0767	2.75%	-1.54%
0.033		3	4.66	4.1	5.21	4.61	4.46	4.9	0.129	4.80%	2.17%
0.0661		3	4.71	4.16	5.26	4.75	4.47	4.91	0.129	4.73%	1.05%
0.134		3	3.7	2.63	4.77	3.9	3.21	4	0.248	11.62%	22.20%

## Graphics

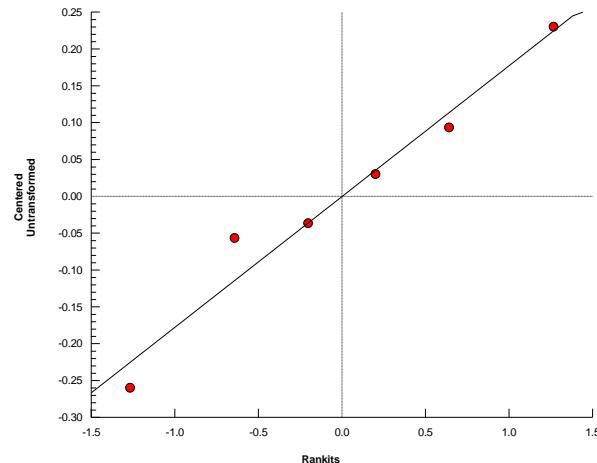
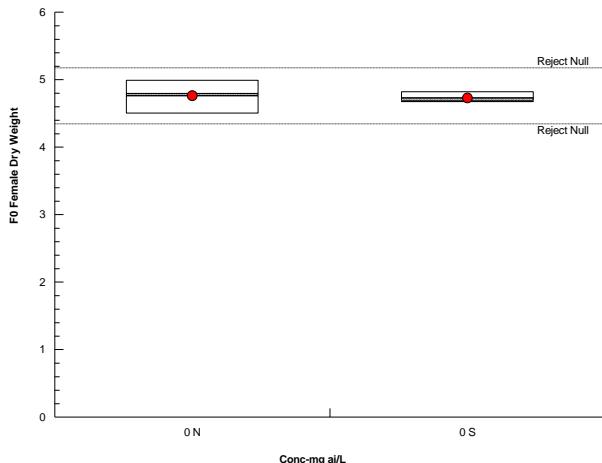


# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 3 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)							EAG (ABC Lab)				
Analysis ID: 04-5760-9659 Analyzed: 02 Apr-19 19:48	Endpoint: F0 Female Dry Weight Analysis: Parametric-Two Sample			CETIS Version: CETISv1.9.5 Status Level: 1							
Batch ID: 01-1053-3132 Start Date: 20 Oct-17 Ending Date: 17 Nov-17 Test Length: 28d 0h	Test Type: Chronic Mysid (28-d) Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life Species: Americamysis bahia Taxon:			Analyst: Diluent: Laboratory seawater + laboratory fresh Brine: Source: Lab In-House Culture Age:							
Data Transform	Alt Hyp			Comparison Result			PMSD				
Untransformed	C <> T			Solvent Blank passed f0 female dry weight			8.74%				
<b>Equal Variance t Two-Sample Test</b>											
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)		
Negative Control	Solvent Blank		0.222	2.78	0.416	4	CDF	0.8348	Non-Significant Effect		
<b>ANOVA Table</b>											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)					
Between	0.0016667	0.0016667	1	0.0495	0.8348	Non-Significant Effect					
Error	0.134667	0.0336667	4								
Total	0.136333		5								
<b>ANOVA Assumptions Tests</b>											
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)					
Variance	Variance Ratio F Test		9.15	199	0.1970	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.979	0.43	0.9451	Normal Distribution					
<b>F0 Female Dry Weight Summary</b>											
Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	4.73	4.52	4.93	4.69	4.67	4.82	0.047	1.72%	0.00%
0	N	3	4.76	4.15	5.37	4.79	4.5	4.99	0.142	5.18%	-0.71%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 4 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)				
Analysis ID:	08-5839-4883	Endpoint:	F0 Female Length	CETIS Version:	CETISv1.9.5			
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Treatments	Status Level:	1			
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:				
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh			
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:				
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture			
Data Transform	Alt Hyp			NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T			0.033	0.0661	0.0467		5.22%

## Dunnett Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	2.46	2.53	0.326	4	CDF	0.0565	Non-Significant Effect	
	0.00745	2.23	2.53	0.326	4	CDF	0.0844	Non-Significant Effect	
	0.0164	2.1	2.53	0.326	4	CDF	0.1046	Non-Significant Effect	
	0.033	2.41	2.53	0.326	4	CDF	0.0618	Non-Significant Effect	
	0.0661*	5.63	2.53	0.326	4	CDF	1.6E-04	Significant Effect	
	0.134*	10.3	2.53	0.326	4	CDF	1.1E-06	Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	3.38918	0.564864	6	22.8	1.8E-06	Significant Effect
Error	0.347	0.0247857	14			
Total	3.73618		20			

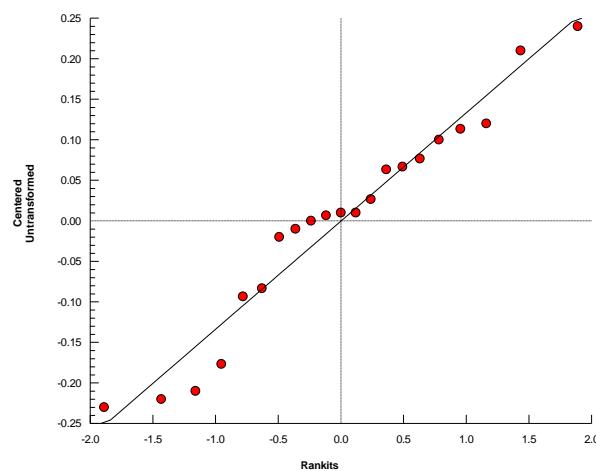
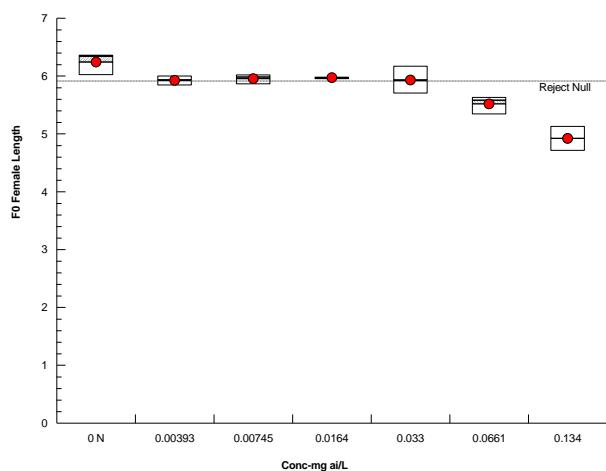
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	8.91	16.8	0.1786	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.951	0.871	0.3516	Normal Distribution

## F0 Female Length Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	6.24	5.77	6.71	6.34	6.02	6.36	0.11	3.06%	0.00%
0.00393		3	5.92	5.72	6.12	5.93	5.84	6	0.0463	1.35%	5.07%
0.00745		3	5.95	5.75	6.16	5.98	5.86	6.02	0.0481	1.40%	4.59%
0.0164		3	5.97	5.93	6.01	5.98	5.95	5.98	0.00997	0.29%	4.33%
0.033		3	5.93	5.35	6.51	5.92	5.7	6.17	0.136	3.97%	4.97%
0.0661		3	5.52	5.13	5.9	5.58	5.34	5.63	0.0895	2.81%	11.59%
0.134		3	4.92	4.4	5.44	4.92	4.71	5.13	0.121	4.27%	21.15%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 5 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)		
Analysis ID:	04-0060-9763	Endpoint:	F0 Female Length	CETIS Version:	CETISv1.9.5	
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Ord.Treatments	Status Level:	1	
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:		
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh	
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:		
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	<0.00393	0.00393	n/a		3.93%

## Williams Multiple Comparison Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393*	2.46	1.76	0.226	4	CDF	<0.05	Significant Effect
		0.00745*	2.35	1.85	0.238	4	CDF	<0.05	Significant Effect
		0.0164*	2.26	1.88	0.241	4	CDF	<0.05	Significant Effect
		0.033*	2.41	1.89	0.243	4	CDF	<0.05	Significant Effect
		0.0661*	5.63	1.9	0.244	4	CDF	<0.05	Significant Effect
		0.134*	10.3	1.91	0.245	4	CDF	<0.05	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	3.38918	0.564864	6	22.8	1.8E-06	Significant Effect
Error	0.347	0.0247857	14			
Total	3.73618		20			

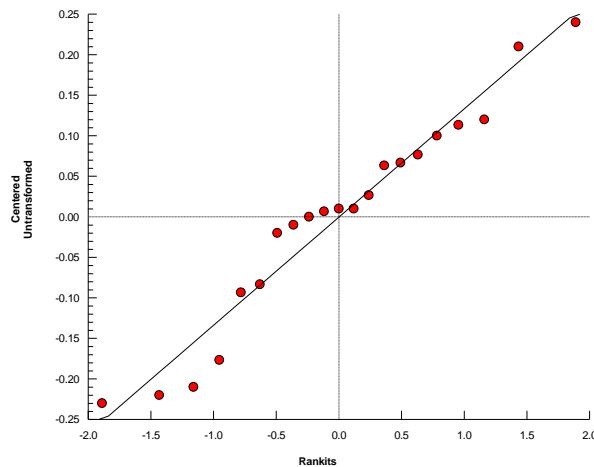
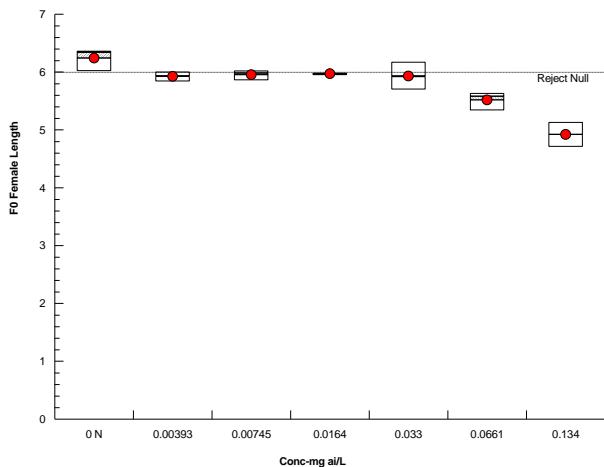
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	8.91	16.8	0.1786	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.951	0.871	0.3516	Normal Distribution

## F0 Female Length Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	6.24	5.77	6.71	6.34	6.02	6.36	0.11	3.06%	0.00%
0.00393		3	5.92	5.72	6.12	5.93	5.84	6	0.0463	1.35%	5.07%
0.00745		3	5.95	5.75	6.16	5.98	5.86	6.02	0.0481	1.40%	4.59%
0.0164		3	5.97	5.93	6.01	5.98	5.95	5.98	0.00997	0.29%	4.33%
0.033		3	5.93	5.35	6.51	5.92	5.7	6.17	0.136	3.97%	4.97%
0.0661		3	5.52	5.13	5.9	5.58	5.34	5.63	0.0895	2.81%	11.59%
0.134		3	4.92	4.4	5.44	4.92	4.71	5.13	0.121	4.27%	21.15%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 6 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

## OPPTS 850.1350 Chronic Invert (Mysid) EAG (ABC Lab)

Analysis ID: 11-4452-0993	Endpoint: F0 Female Length	CETIS Version: CETISv1.9.5
Analyzed: 02 Apr-19 19:48	Analysis: Parametric-Two Sample	Status Level: 1
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture Age:
Data Transform	Alt Hyp	Comparison Result
Untransformed	C < T	Solvent Blank passed f0 female length 5.06%

### Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)
Negative Control		Solvent Blank	0.674	2.78	0.316	4	CDF	0.5373	Non-Significant Effect

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)
Between	0.0088167	0.0088167	1	0.454	0.5373	Non-Significant Effect
Error	0.0776667	0.0194167	4			
Total	0.0864833		5			

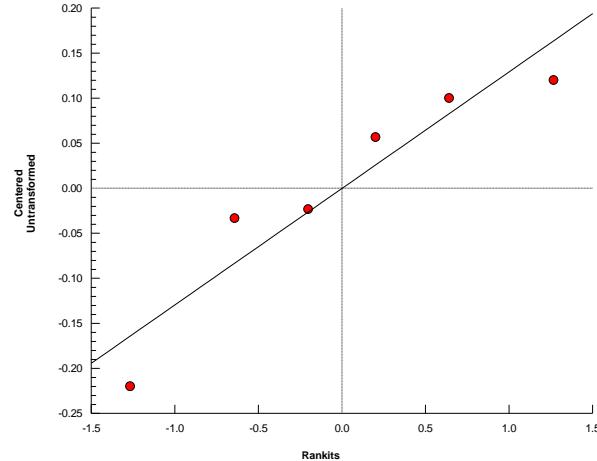
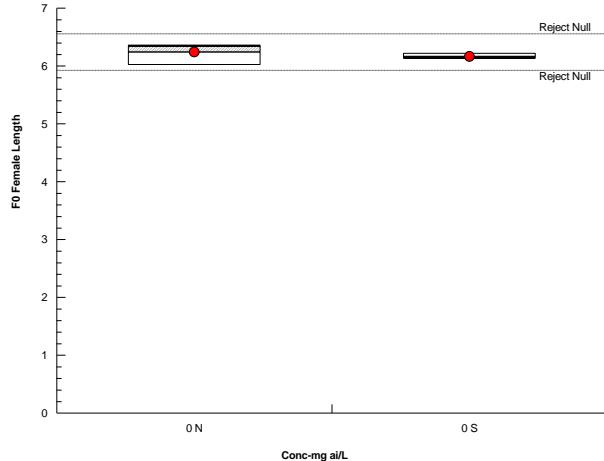
### ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)
Variance	Variance Ratio F Test	15	199	0.1253	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.891	0.43	0.3248	Normal Distribution

### F0 Female Length Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	6.16	6.04	6.29	6.14	6.13	6.22	0.0285	0.80%	0.00%
0	N	3	6.24	5.77	6.71	6.34	6.02	6.36	0.11	3.06%	-1.24%

### Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 7 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)				
Analysis ID:	09-2745-6548	Endpoint:	F0 Male Dry Weight	CETIS Version:	CETISv1.9.5			
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Treatments	Status Level:	1			
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:				
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh			
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:				
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture			
Data Transform	Alt Hyp			NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T			0.0661	0.134	0.09411		6.20%

## Dunnett Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	0.671	2.53	0.289	4	CDF	0.6070	Non-Significant Effect	
	0.00745	0.437	2.53	0.289	4	CDF	0.7077	Non-Significant Effect	
	0.0164	0.146	2.53	0.289	4	CDF	0.8143	Non-Significant Effect	
	0.033	1.34	2.53	0.289	4	CDF	0.3133	Non-Significant Effect	
	0.0661	1.78	2.53	0.289	4	CDF	0.1729	Non-Significant Effect	
	0.134*	9.77	2.53	0.289	4	CDF	1.2E-06	Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	2.84125	0.473541	6	24.2	1.3E-06	Significant Effect
Error	0.274333	0.0195952	14			
Total	3.11558		20			

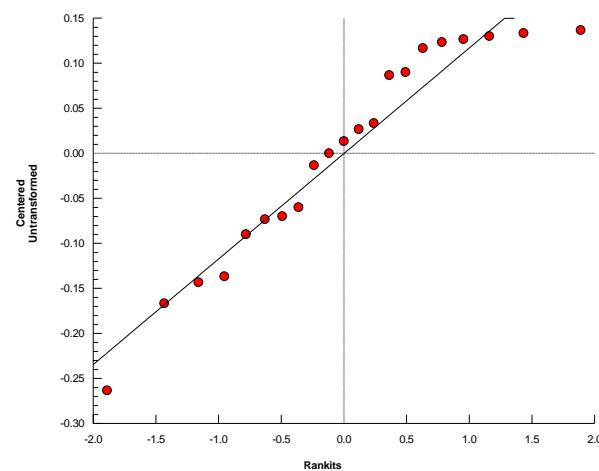
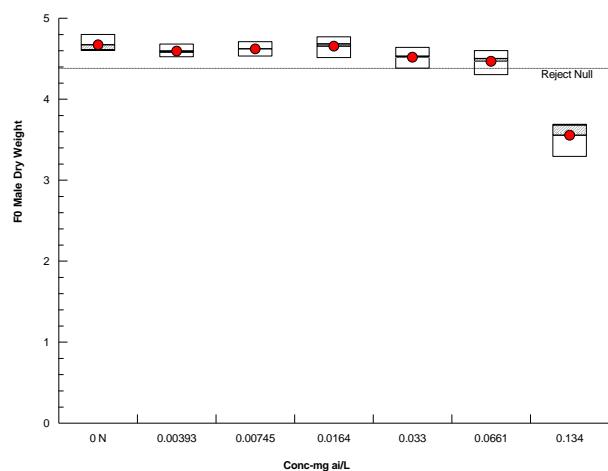
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	2.56	16.8	0.8622	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.923	0.871	0.0991	Normal Distribution

## F0 Male Dry Weight Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	4.67	4.39	4.95	4.61	4.6	4.8	0.0651	2.41%	0.00%
0.00393		3	4.59	4.39	4.79	4.58	4.52	4.68	0.0467	1.76%	1.64%
0.00745		3	4.62	4.4	4.84	4.62	4.53	4.71	0.052	1.95%	1.07%
0.0164		3	4.65	4.33	4.98	4.68	4.51	4.77	0.0762	2.84%	0.36%
0.033		3	4.52	4.19	4.84	4.53	4.38	4.64	0.0754	2.89%	3.28%
0.0661		3	4.47	4.09	4.85	4.5	4.3	4.6	0.0882	3.42%	4.35%
0.134		3	3.55	2.99	4.12	3.68	3.29	3.69	0.132	6.42%	23.91%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 8 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 17-0709-3237	Endpoint: F0 Male Dry Weight	CETIS Version: CETISv1.9.5			
Analyzed: 02 Apr-19 19:47	Analysis: Parametric-Control vs Ord.Treatments	Status Level: 1			
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:			
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh			
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:			
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture		Age:	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	
Untransformed	C > T	0.0661	0.134	0.09411	PMSD 4.66%

## Williams Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393	0.671	1.76	0.201	4	CDF	>0.05	Non-Significant Effect
		0.00745	0.554	1.85	0.211	4	CDF	>0.05	Non-Significant Effect
		0.0164	0.418	1.88	0.215	4	CDF	>0.05	Non-Significant Effect
		0.033	1.34	1.89	0.216	4	CDF	>0.05	Non-Significant Effect
		0.0661	1.78	1.9	0.217	4	CDF	>0.05	Non-Significant Effect
		0.134*	9.77	1.91	0.218	4	CDF	<0.05	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	2.84125	0.473541	6	24.2	1.3E-06	Significant Effect
Error	0.274333	0.0195952	14			
Total	3.11558		20			

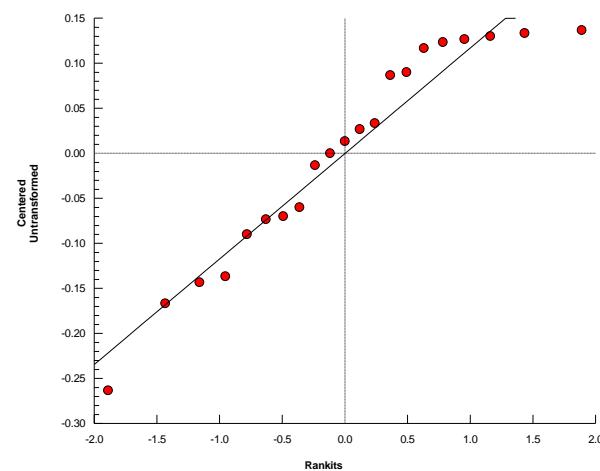
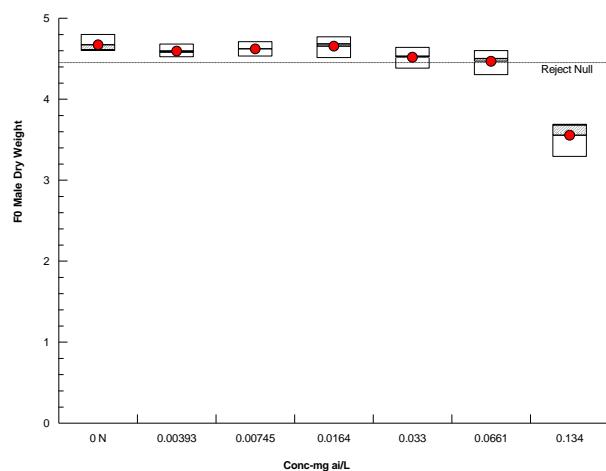
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	2.56	16.8	0.8622	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.923	0.871	0.0991	Normal Distribution

## F0 Male Dry Weight Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	4.67	4.39	4.95	4.61	4.6	4.8	0.0651	2.41%	0.00%
0.00393		3	4.59	4.39	4.79	4.58	4.52	4.68	0.0467	1.76%	1.64%
0.00745		3	4.62	4.4	4.84	4.62	4.53	4.71	0.052	1.95%	1.07%
0.0164		3	4.65	4.33	4.98	4.68	4.51	4.77	0.0762	2.84%	0.36%
0.033		3	4.52	4.19	4.84	4.53	4.38	4.64	0.0754	2.89%	3.28%
0.0661		3	4.47	4.09	4.85	4.5	4.3	4.6	0.0882	3.42%	4.35%
0.134		3	3.55	2.99	4.12	3.68	3.29	3.69	0.132	6.42%	23.91%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 9 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

## OPPTS 850.1350 Chronic Invert (Mysid) EAG (ABC Lab)

Analysis ID:	03-0362-8369	Endpoint:	F0 Male Dry Weight	CETIS Version:	CETISv1.9.5
Analyzed:	02 Apr-19 19:48	Analysis:	Parametric-Two Sample	Status Level:	1
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:	
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:	
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture
Data Transform	Alt Hyp			Comparison Result	PMSD
Untransformed	C <> T			Solvent Blank passed f0 male dry weight	4.40%

### Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)
Negative Control		Solvent Blank	0.315	2.78	0.205	4	CDF	0.7683	Non-Significant Effect

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)
Between	0.0008167	0.0008167	1	0.0994	0.7683	Non-Significant Effect
Error	0.0328667	0.0082167	4			
Total	0.0336833		5			

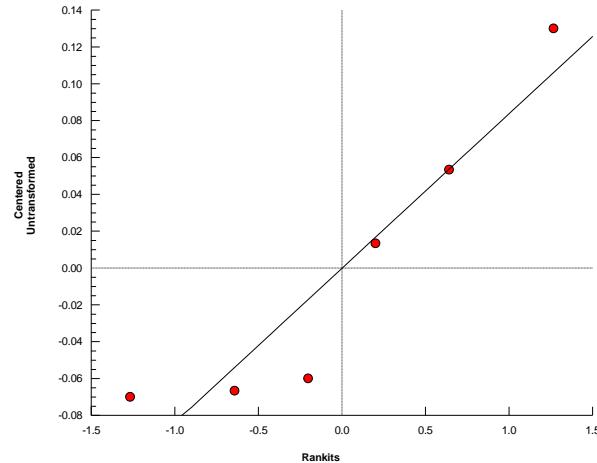
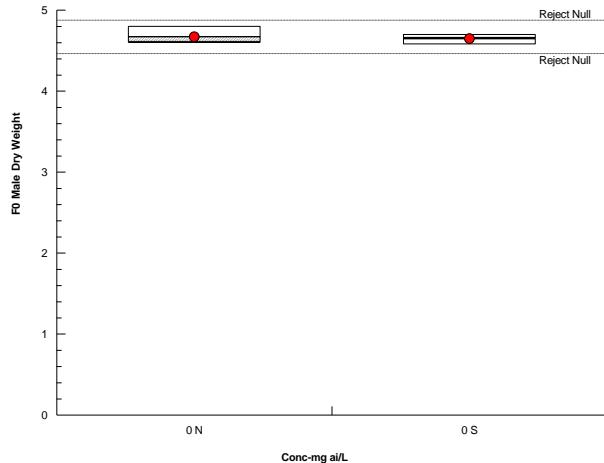
### ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)
Variance	Variance Ratio F Test	3.4	199	0.4544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.866	0.43	0.2124	Normal Distribution

### F0 Male Dry Weight Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	4.65	4.49	4.8	4.66	4.58	4.7	0.0353	1.31%	0.00%
0	N	3	4.67	4.39	4.95	4.61	4.6	4.8	0.0651	2.41%	-0.50%

### Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 10 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)				
Analysis ID:	08-9224-1878	Endpoint:	F0 Male Length	CETIS Version:	CETISv1.9.5			
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Treatments	Status Level:	1			
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:				
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh			
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:				
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture			
Data Transform	Alt Hyp			NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T			0.00393	0.00745	0.005411		3.81%

## Dunnett Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393	2.2	2.53	0.223	4	CDF	0.0891	Non-Significant Effect
		0.00745*	3.41	2.53	0.223	4	CDF	0.0098	Significant Effect
		0.0164*	3.15	2.53	0.223	4	CDF	0.0162	Significant Effect
		0.033*	6.03	2.53	0.223	4	CDF	8.2E-05	Significant Effect
		0.0661*	7.09	2.53	0.223	4	CDF	1.5E-05	Significant Effect
		0.134*	14.2	2.53	0.223	4	CDF	8.7E-07	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	3.00783	0.501305	6	43.2	<1.0E-37	Significant Effect
Error	0.162467	0.0116048	14			
Total	3.1703		20			

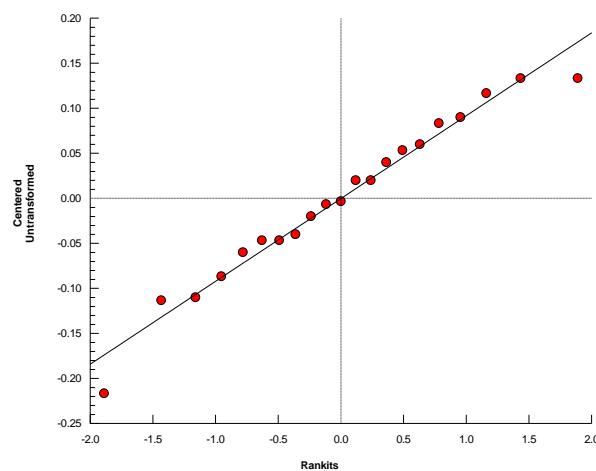
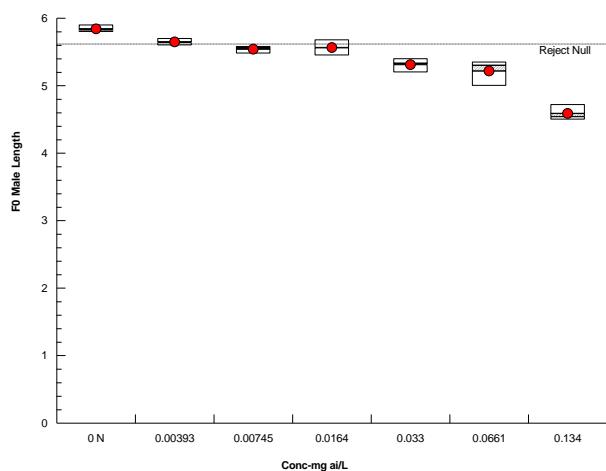
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	5.14	16.8	0.5264	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.969	0.871	0.7132	Normal Distribution

## F0 Male Length Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	5.84	5.71	5.97	5.82	5.8	5.9	0.0306	0.91%	0.00%
0.00393		3	5.65	5.52	5.77	5.64	5.6	5.7	0.0291	0.89%	3.31%
0.00745		3	5.54	5.41	5.67	5.56	5.48	5.58	0.0305	0.95%	5.14%
0.0164		3	5.56	5.28	5.85	5.56	5.45	5.68	0.0664	2.07%	4.74%
0.033		3	5.31	5.06	5.56	5.33	5.2	5.4	0.0586	1.91%	9.08%
0.0661		3	5.22	4.75	5.69	5.3	5	5.35	0.109	3.63%	10.67%
0.134		3	4.59	4.3	4.88	4.54	4.5	4.72	0.0677	2.55%	21.46%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 11 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 19-7829-1663	Endpoint: F0 Male Length	CETIS Version: CETISv1.9.5			
Analyzed: 02 Apr-19 19:47	Analysis: Parametric-Control vs Ord.Treatments	Status Level: 1			
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:			
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh			
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:			
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture		Age:	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	
Untransformed	C > T	<0.00393	0.00393	n/a	PMSD 2.87%

## Williams Multiple Comparison Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393*	2.2	1.76	0.155	4	CDF	<0.05	Significant Effect
		0.00745*	3.41	1.85	0.163	4	CDF	<0.05	Significant Effect
		0.0164*	3.28	1.88	0.165	4	CDF	<0.05	Significant Effect
		0.033*	6.03	1.89	0.166	4	CDF	<0.05	Significant Effect
		0.0661*	7.09	1.9	0.167	4	CDF	<0.05	Significant Effect
		0.134*	14.2	1.91	0.168	4	CDF	<0.05	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	3.00783	0.501305	6	43.2	<1.0E-37	Significant Effect
Error	0.162467	0.0116048	14			
Total	3.1703		20			

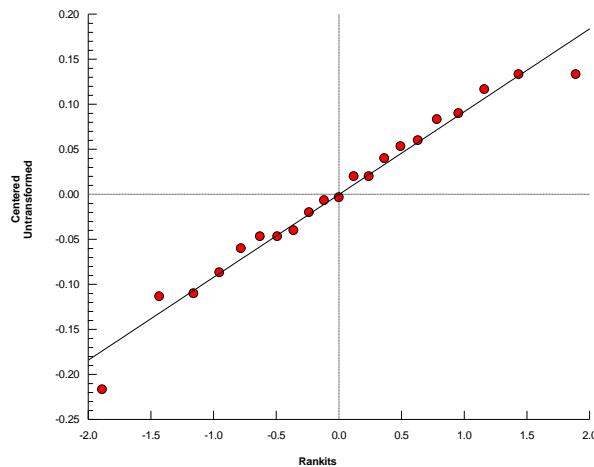
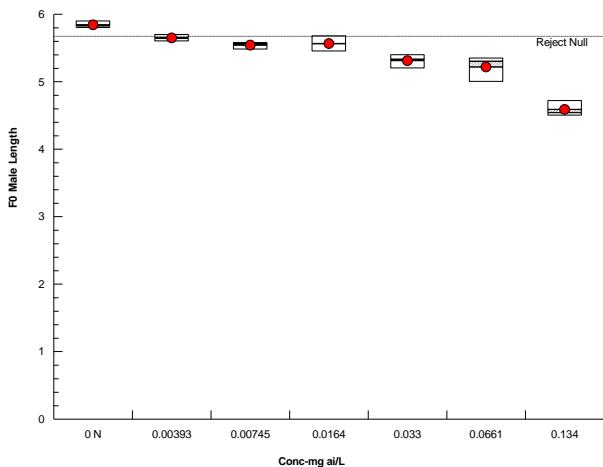
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	5.14	16.8	0.5264	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.969	0.871	0.7132	Normal Distribution

## F0 Male Length Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	5.84	5.71	5.97	5.82	5.8	5.9	0.0306	0.91%	0.00%
0.00393		3	5.65	5.52	5.77	5.64	5.6	5.7	0.0291	0.89%	3.31%
0.00745		3	5.54	5.41	5.67	5.56	5.48	5.58	0.0305	0.95%	5.14%
0.0164		3	5.56	5.28	5.85	5.56	5.45	5.68	0.0664	2.07%	4.74%
0.033		3	5.31	5.06	5.56	5.33	5.2	5.4	0.0586	1.91%	9.08%
0.0661		3	5.22	4.75	5.69	5.3	5	5.35	0.109	3.63%	10.67%
0.134		3	4.59	4.3	4.88	4.54	4.5	4.72	0.0677	2.55%	21.46%

## Graphics

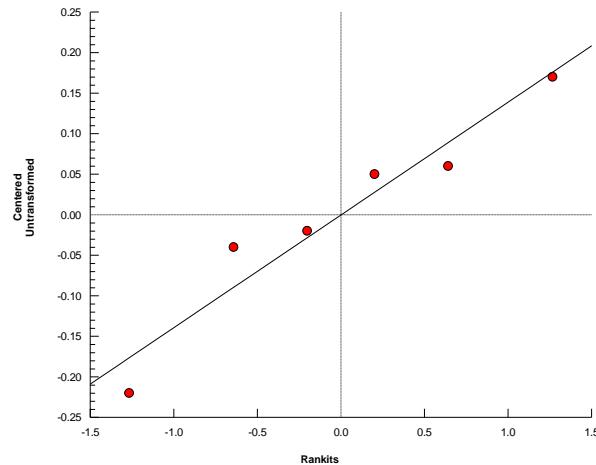
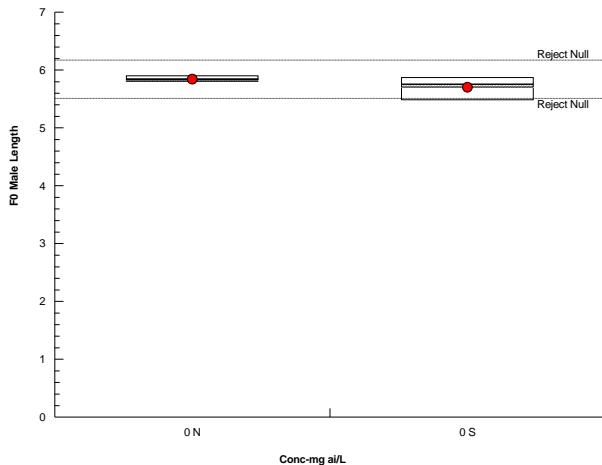


# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 12 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)							EAG (ABC Lab)				
Analysis ID: 16-1013-1267 Analyzed: 02 Apr-19 19:48	Endpoint: F0 Male Length Analysis: Parametric-Two Sample			CETIS Version: CETISv1.9.5 Status Level: 1							
Batch ID: 01-1053-3132 Start Date: 20 Oct-17 Ending Date: 17 Nov-17 Test Length: 28d 0h	Test Type: Chronic Mysid (28-d) Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life Species: Americamysis bahia Taxon:			Analyst: Diluent: Laboratory seawater + laboratory fresh Brine: Source: Lab In-House Culture Age:							
Data Transform	Alt Hyp			Comparison Result			PMSD				
Untransformed	C < T			Solvent Blank passed f0 male length			5.67%				
<b>Equal Variance t Two-Sample Test</b>											
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)		
Negative Control	Solvent Blank		1.17	2.78	0.331	4	CDF	0.3057	Non-Significant Effect		
<b>ANOVA Table</b>											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)					
Between	0.0294	0.0294	1	1.38	0.3057	Non-Significant Effect					
Error	0.0854	0.02135	4								
Total	0.1148		5								
<b>ANOVA Assumptions Tests</b>											
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)					
Variance	Variance Ratio F Test		14.2	199	0.1311	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.951	0.43	0.7497	Normal Distribution					
<b>F0 Male Length Summary</b>											
Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	5.7	5.2	6.2	5.75	5.48	5.87	0.115	3.50%	0.00%
0	N	3	5.84	5.71	5.97	5.82	5.8	5.9	0.0306	0.91%	-2.46%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 13 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)		
Analysis ID:	16-1424-9454	Endpoint:	F0 Survival Post Pairing	CETIS Version:	CETISv1.9.5	
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Treatments	Status Level:	1	
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:		
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh	
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:		
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	0.033	0.0661	0.0467		32.66%

## Dunnett Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	1.22	2.53	0.298	4	CDF	0.3607	Non-Significant Effect	
	0.00745	-0.0834	2.53	0.298	4	CDF	0.8783	Non-Significant Effect	
	0.0164	2.33	2.53	0.298	4	CDF	0.0706	Non-Significant Effect	
	0.033	2.09	2.53	0.298	4	CDF	0.1059	Non-Significant Effect	
	0.0661*	2.99	2.53	0.298	4	CDF	0.0215	Significant Effect	
	0.134	1.28	2.53	0.298	4	CDF	0.3355	Non-Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	0.337343	0.0562238	6	2.7	0.0589	Non-Significant Effect
Error	0.291412	0.0208152	14			
Total	0.628755		20			

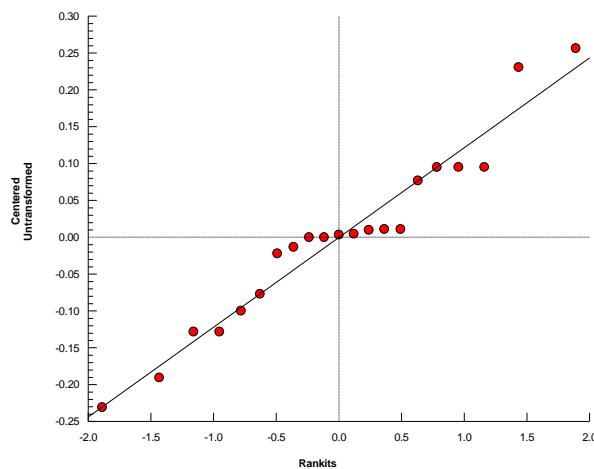
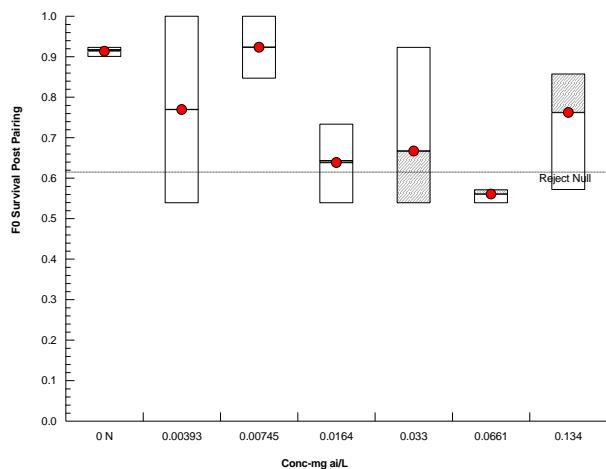
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	15.1	16.8	0.0192	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.954	0.871	0.3967	Normal Distribution

## F0 Survival Post Pairing Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.913	0.884	0.943	0.917	0.900	0.923	0.007	1.30%	0.00%
0.00393		3	0.769	0.196	1.000	0.769	0.538	1.000	0.133	30.00%	15.77%
0.00745		3	0.923	0.732	1.000	0.923	0.846	1.000	0.044	8.33%	-1.08%
0.0164		3	0.638	0.396	0.880	0.643	0.538	0.733	0.056	15.28%	30.12%
0.033		3	0.667	0.115	1.000	0.538	0.538	0.923	0.128	33.31%	27.00%
0.0661		3	0.560	0.513	0.608	0.571	0.538	0.571	0.011	3.40%	38.63%
0.134		3	0.762	0.352	1.000	0.857	0.571	0.857	0.095	21.65%	16.57%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 14 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 04-3512-3025	Endpoint: F0 Survival Post Pairing	CETIS Version: CETISv1.9.5			
Analyzed: 02 Apr-19 19:47	Analysis: Parametric-Control vs Ord.Treatments	Status Level: 1			
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:			
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh			
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:			
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture		Age:	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	
Untransformed	C > T	0.00745	0.0164	0.01105	PMSD 24.59%

## Williams Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	1.22	1.76	0.207	4	CDF	>0.05	Non-Significant Effect	
	0.00745	0.57	1.85	0.218	4	CDF	>0.05	Non-Significant Effect	
	0.0164*	2.33	1.88	0.221	4	CDF	<0.05	Significant Effect	
	0.033*	2.21	1.89	0.223	4	CDF	<0.05	Significant Effect	
	0.0661*	2.99	1.9	0.224	4	CDF	<0.05	Significant Effect	
	0.134*	2.18	1.91	0.225	4	CDF	<0.05	Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	0.337343	0.0562238	6	2.7	0.0589	Non-Significant Effect
Error	0.291412	0.0208152	14			
Total	0.628755		20			

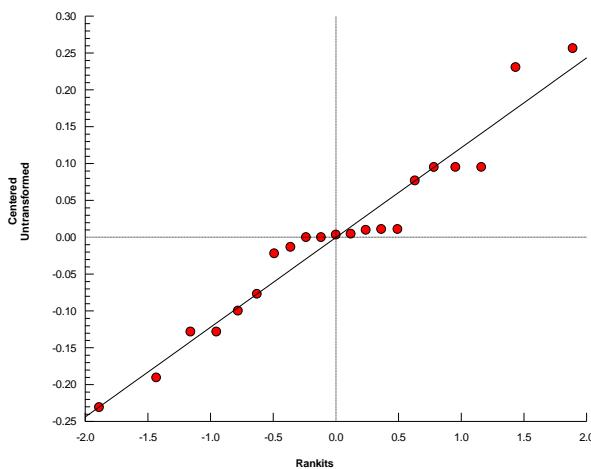
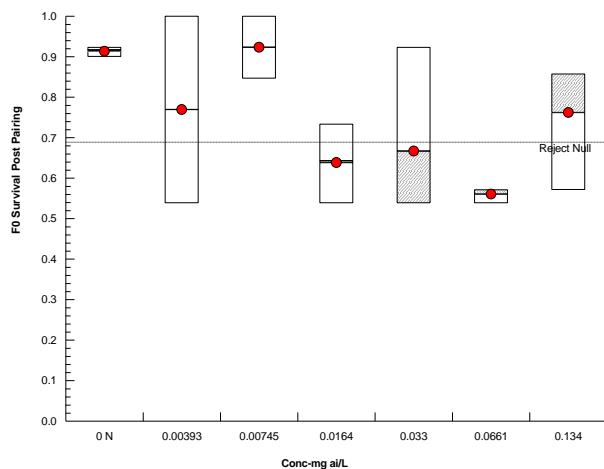
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	15.1	16.8	0.0192	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.954	0.871	0.3967	Normal Distribution

## F0 Survival Post Pairing Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.913	0.884	0.943	0.917	0.900	0.923	0.007	1.30%	0.00%
0.00393		3	0.769	0.196	1.000	0.769	0.538	1.000	0.133	30.00%	15.77%
0.00745		3	0.923	0.732	1.000	0.923	0.846	1.000	0.044	8.33%	-1.08%
0.0164		3	0.638	0.396	0.880	0.643	0.538	0.733	0.056	15.28%	30.12%
0.033		3	0.667	0.115	1.000	0.538	0.538	0.923	0.128	33.31%	27.00%
0.0661		3	0.560	0.513	0.608	0.571	0.538	0.571	0.011	3.40%	38.63%
0.134		3	0.762	0.352	1.000	0.857	0.571	0.857	0.095	21.65%	16.57%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 15 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

## OPPTS 850.1350 Chronic Invert (Mysid) EAG (ABC Lab)

Analysis ID: 07-6916-1740 Analyzed: 02 Apr-19 19:48	Endpoint: F0 Survival Post Pairing Analysis: Parametric-Two Sample	CETIS Version: CETISv1.9.5 Status Level: 1
Batch ID: 01-1053-3132 Start Date: 20 Oct-17 Ending Date: 17 Nov-17 Test Length: 28d 0h	Test Type: Chronic Mysid (28-d) Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life Cycle) Species: Americamysis bahia Taxon:	Analyst: Diluent: Laboratory seawater + laboratory fresh Brine: Source: Lab In-House Culture Age:
Data Transform	Alt Hyp	Comparison Result
Untransformed	C < T	Solvent Blank passed f0 survival post pairing 17.91%

### Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		Solvent Blank	0.0632	2.78	0.164	4	CDF	0.9526	Non-Significant Effect

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	2.080E-05	2.080E-05	1	0.004	0.9526	Non-Significant Effect
Error	0.020828	0.0052070	4			
Total	0.0208488		5			

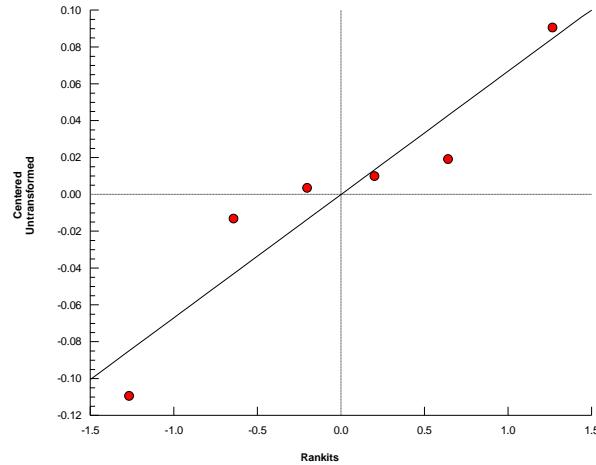
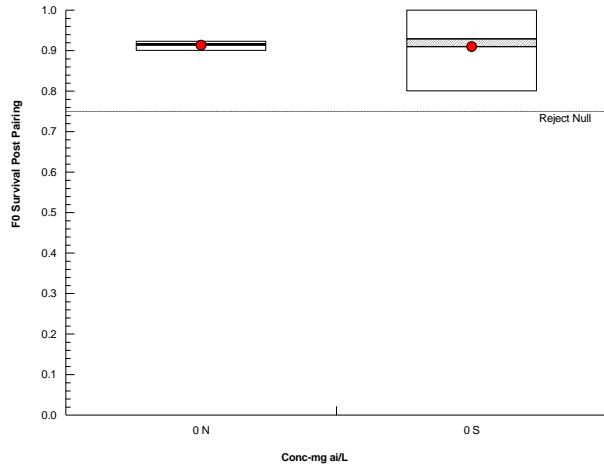
### ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Variance Ratio F Test	72.4	199	0.0273	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.917	0.43	0.4864	Normal Distribution

### F0 Survival Post Pairing Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	0.910	0.658	1.000	0.929	0.800	1.000	0.059	11.14%	0.00%
0	N	3	0.913	0.884	0.943	0.917	0.900	0.923	0.007	1.30%	-0.41%

### Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 16 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 01-4790-5368	Endpoint: F0 Survival Pre Pairing	CETIS Version: CETISv1.9.5			
Analyzed: 02 Apr-19 19:47	Analysis: Nonparametric-Two Sample	Status Level: 1			
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:			
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh			
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:			
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture		Age:	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	
Untransformed	C > T	0.0661	0.134	0.09411	PMSD 15.35%

## Mann-Whitney U Two-Sample Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393	4.5	n/a	1	4	Exact	0.7000	Non-Significant Effect
		0.00745	7.5	n/a	1	4	Exact	0.2000	Non-Significant Effect
		0.0164	4.5	n/a	1	4	Exact	0.7000	Non-Significant Effect
		0.033	7.5	n/a	1	4	Exact	0.2000	Non-Significant Effect
		0.0661	7.5	n/a	1	4	Exact	0.2000	Non-Significant Effect
		0.134*	9	n/a	0	4	Exact	0.0500	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	0.0651852	0.0108642	6	1.6	0.2181	Non-Significant Effect
Error	0.0948148	0.0067725	14			
Total	0.16		20			

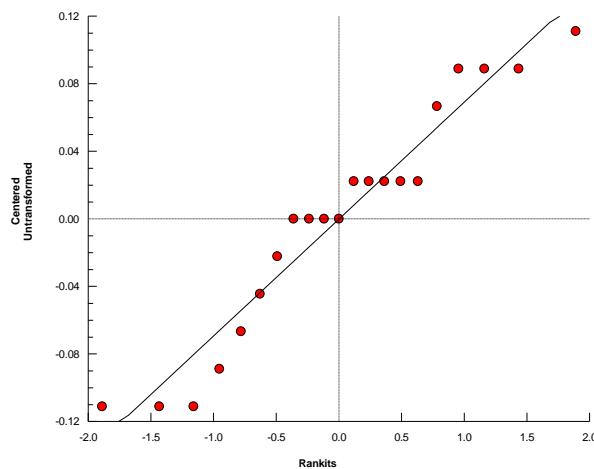
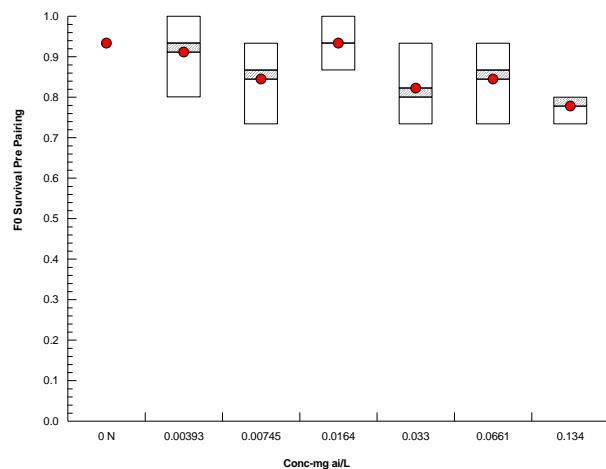
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	53.2	16.8	<1.0E-37	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.929	0.871	0.1289	Normal Distribution

## F0 Survival Pre Pairing Summary

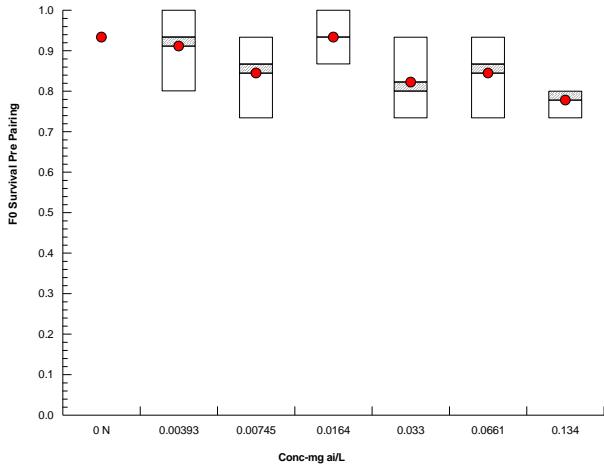
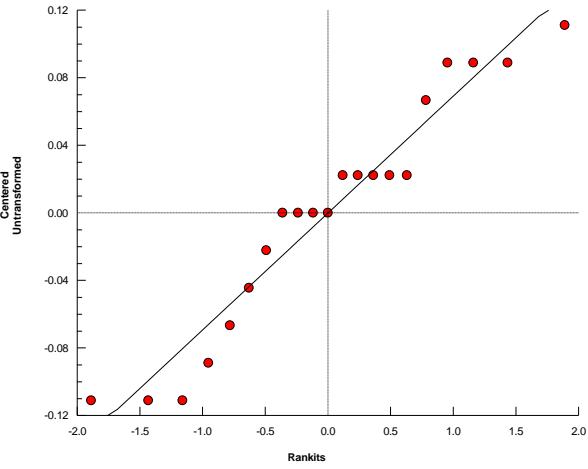
Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.933	0.933	0.934	0.933	0.933	0.933	0.000	0.00%	0.00%
0.00393		3	0.911	0.658	1.000	0.933	0.800	1.000	0.059	11.18%	2.38%
0.00745		3	0.844	0.591	1.000	0.867	0.733	0.933	0.059	12.06%	9.52%
0.0164		3	0.933	0.768	1.000	0.933	0.867	1.000	0.039	7.14%	0.00%
0.033		3	0.822	0.569	1.000	0.800	0.733	0.933	0.059	12.39%	11.90%
0.0661		3	0.844	0.591	1.000	0.867	0.733	0.933	0.059	12.06%	9.52%
0.134		3	0.778	0.682	0.873	0.800	0.733	0.800	0.022	4.95%	16.67%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 17 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)							EAG (ABC Lab)								
Analysis ID: 18-1840-7952 Analyzed: 02 Apr-19 19:47		Endpoint: F0 Survival Pre Pairing Analysis: Nonparametric-Control vs Ord. Treatments			CETIS Version: CETISv1.9.5 Status Level: 1										
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)			Analyst:											
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life			Diluent: Laboratory seawater + laboratory fresh											
Ending Date: 17 Nov-17	Species: Americamysis bahia			Brine:											
Test Length: 28d 0h	Taxon:			Source: Lab In-House Culture				Age:							
Data Transform		Alt Hyp			NOEL	LOEL	TOEL	TU							
Untransformed		C > T			0.0661	0.134	0.09411								
Jonckheere-Terpstra Step-Down Test															
Control	vs	Conc-mg ai/L	Test Stat	Critical	Ties	P-Type	P-Value	Decision( $\alpha$ :5%)							
Negative Control		0.00393	0	1.64	1	Asymp	0.5000	Non-Significant Effect							
		0.00745	1.22	1.64	1	Asymp	0.3801	Non-Significant Effect							
		0.0164	0.305	1.64	2	Asymp	0.3801	Non-Significant Effect							
		0.033	1.18	1.64	4	Asymp	0.1186	Non-Significant Effect							
		0.0661	1.46	1.64	4	Asymp	0.0718	Non-Significant Effect							
		0.134*	2.26	1.64	4	Asymp	0.0120	Significant Effect							
ANOVA Table															
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision( $\alpha$ :5%)							
Between	0.0651852		0.0108642		6	1.6	0.2181	Non-Significant Effect							
Error	0.0948148		0.0067725		14										
Total	0.16				20										
ANOVA Assumptions Tests															
Attribute	Test			Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)								
Variance	Bartlett Equality of Variance Test			53.2	16.8	<1.0E-37	Unequal Variances								
Distribution	Shapiro-Wilk W Normality Test			0.929	0.871	0.1289	Normal Distribution								
F0 Survival Pre Pairing Summary															
Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect				
0	N	3	0.933	0.933	0.934	0.933	0.933	0.933	0.000	0.00%	0.00%				
0.00393		3	0.911	0.658	1.000	0.933	0.800	1.000	0.059	11.18%	2.38%				
0.00745		3	0.844	0.591	1.000	0.867	0.733	0.933	0.059	12.06%	9.52%				
0.0164		3	0.933	0.768	1.000	0.933	0.867	1.000	0.039	7.14%	0.00%				
0.033		3	0.822	0.569	1.000	0.800	0.733	0.933	0.059	12.39%	11.90%				
0.0661		3	0.844	0.591	1.000	0.867	0.733	0.933	0.059	12.06%	9.52%				
0.134		3	0.778	0.682	0.873	0.800	0.733	0.800	0.022	4.95%	16.67%				
Graphics															
															
															

# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 18 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)
Analysis ID: 05-8172-1073	Endpoint: F0 Survival Pre Pairing	CETIS Version: CETISv1.9.5		
Analyzed: 02 Apr-19 19:49	Analysis: Parametric-Two Sample	Status Level: 1		
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:		
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh		
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:		
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture	Age:	
Data Transform	Alt Hyp	Comparison Result		PMSD
Untransformed	C <-> T	Solvent Blank passed f0 survival pre pairing		27.10%

## Unequal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)
Negative Control		Solvent Blank	0.756	4.3	0.253	2	CDF	0.5286	Non-Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)
Between	0.002963	0.002963	1	0.571	0.4918	Non-Significant Effect
Error	0.0207407	0.0051852	4			
Total	0.0237037		5			

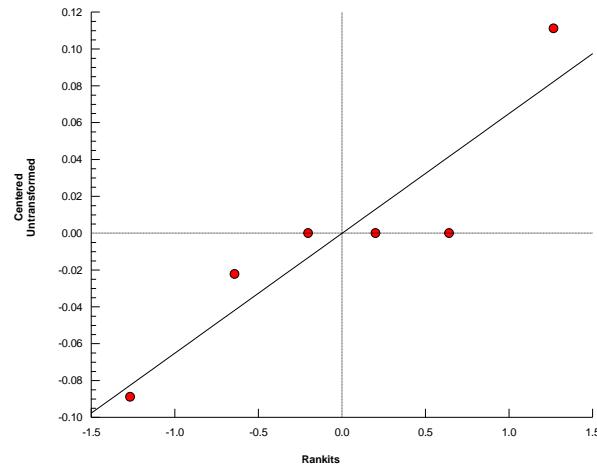
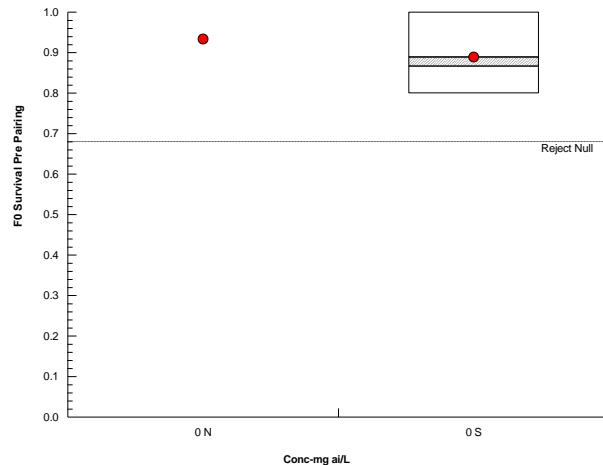
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)
Variance	Variance Ratio F Test	7.01E+13	199	<1.0E-37	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.877	0.43	0.2535	Normal Distribution

## F0 Survival Pre Pairing Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	0.889	0.636	1.000	0.867	0.800	1.000	0.059	11.46%	0.00%
0	N	3	0.933	0.933	0.934	0.933	0.933	0.933	0.000	0.00%	-5.00%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 19 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)				
Analysis ID:	20-3713-2823	Endpoint:	F1 Survival	CETIS Version:	CETISv1.9.5			
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Treatments	Status Level:	1			
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:				
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh			
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:				
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture			
Data Transform	Alt Hyp			NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T			0.134	>0.134	n/a		16.24%

## Dunnett Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	-0.332	2.53	0.159	4	CDF	0.9277	Non-Significant Effect	
	0.00745	0.755	2.53	0.159	4	CDF	0.5687	Non-Significant Effect	
	0.0164	1.08	2.53	0.159	4	CDF	0.4198	Non-Significant Effect	
	0.033	-0.332	2.53	0.159	4	CDF	0.9277	Non-Significant Effect	
	0.0661	1.79	2.53	0.159	4	CDF	0.1697	Non-Significant Effect	
	0.134	2.32	2.53	0.159	4	CDF	0.0721	Non-Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	0.0777363	0.0129561	6	2.19	0.1064	Non-Significant Effect
Error	0.0828045	0.0059146	14			
Total	0.160541		20			

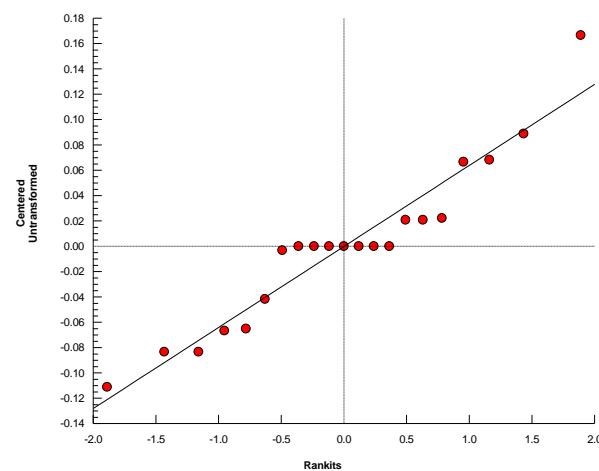
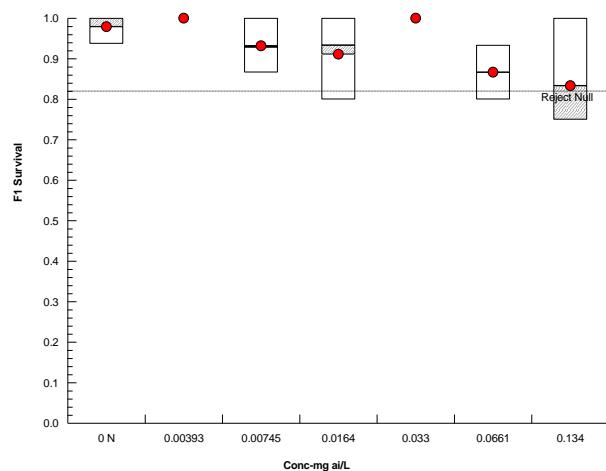
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Levene Equality of Variance Test	4.5	4.46	0.0096	Unequal Variances
	Mod Levene Equality of Variance Test	0.908	7.19	0.5386	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.932	0.871	0.1492	Normal Distribution

## F1 Survival Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.979	0.890	1.000	1.000	0.938	1.000	0.021	3.69%	0.00%
0.00393		3	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-2.13%
0.00745		3	0.932	0.766	1.000	0.929	0.867	1.000	0.039	7.16%	4.84%
0.0164		3	0.911	0.658	1.000	0.933	0.800	1.000	0.059	11.18%	6.95%
0.033		3	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-2.13%
0.0661		3	0.867	0.701	1.000	0.867	0.800	0.933	0.039	7.69%	11.49%
0.134		3	0.833	0.475	1.000	0.750	0.750	1.000	0.083	17.32%	14.89%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 20 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)				
Analysis ID:	13-8736-5062	Endpoint:	F1 Survival	CETIS Version:	CETISv1.9.5			
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Ord.Treatments	Status Level:	1			
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:				
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh			
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:				
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture			
Data Transform	Alt Hyp			NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T			0.0661	0.134	0.09411		12.22%

## Williams Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	-0.332	1.76	0.111	4	CDF	>0.05	Non-Significant Effect	
	0.00745	0.755	1.85	0.116	4	CDF	>0.05	Non-Significant Effect	
	0.0164	1.08	1.88	0.118	4	CDF	>0.05	Non-Significant Effect	
	0.033	0.502	1.89	0.119	4	CDF	>0.05	Non-Significant Effect	
	0.0661	1.79	1.9	0.119	4	CDF	>0.05	Non-Significant Effect	
	0.134*	2.32	1.91	0.12	4	CDF	<0.05	Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	0.0777363	0.0129561	6	2.19	0.1064	Non-Significant Effect
Error	0.0828045	0.0059146	14			
Total	0.160541		20			

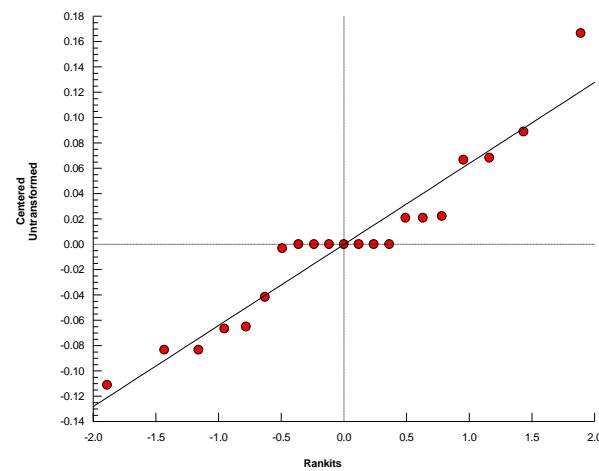
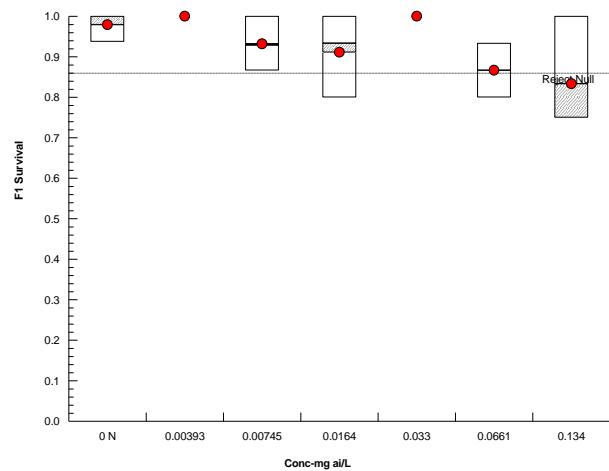
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Levene Equality of Variance Test	4.5	4.46	0.0096	Unequal Variances
	Mod Levene Equality of Variance Test	0.908	7.19	0.5386	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.932	0.871	0.1492	Normal Distribution

## F1 Survival Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.979	0.890	1.000	1.000	0.938	1.000	0.021	3.69%	0.00%
0.00393		3	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-2.13%
0.00745		3	0.932	0.766	1.000	0.929	0.867	1.000	0.039	7.16%	4.84%
0.0164		3	0.911	0.658	1.000	0.933	0.800	1.000	0.059	11.18%	6.95%
0.033		3	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-2.13%
0.0661		3	0.867	0.701	1.000	0.867	0.800	0.933	0.039	7.69%	11.49%
0.134		3	0.833	0.475	1.000	0.750	0.750	1.000	0.083	17.32%	14.89%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 21 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

## OPPTS 850.1350 Chronic Invert (Mysid) EAG (ABC Lab)

Analysis ID:	08-5293-4373	Endpoint:	F1 Survival	CETIS Version:	CETISv1.9.5
Analyzed:	02 Apr-19 19:49	Analysis:	Parametric-Two Sample	Status Level:	1
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:	
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:	
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture
Data Transform	Alt Hyp			Comparison Result	PMSD
Untransformed	C < T			Solvent Blank passed f1 survival	9.90%

### Unequal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)
Negative Control		Solvent Blank	0.0456	3.18	0.097	3	CDF	0.9665	Non-Significant Effect

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)
Between	2.894E-06	2.894E-06	1	0.00208	0.9658	Non-Significant Effect
Error	0.0055671	0.0013918	4			
Total	0.0055700		5			

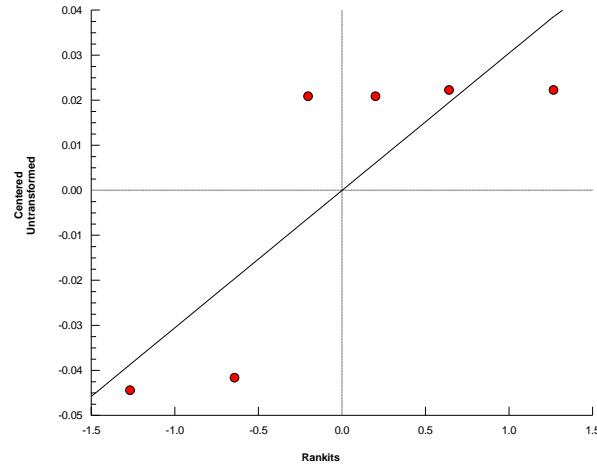
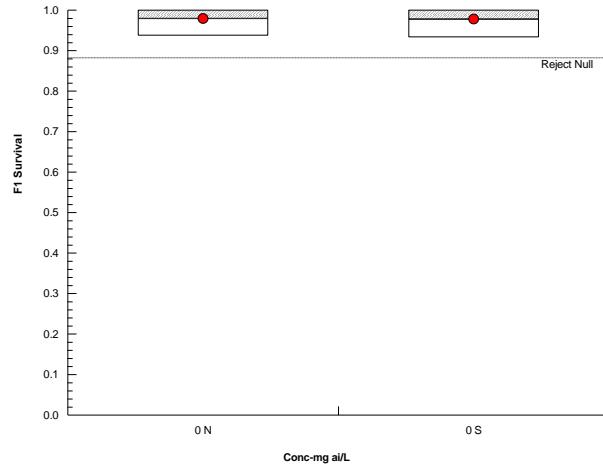
### ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)
Variance	Variance Ratio F Test	1.14	199	0.9356	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.664	0.43	0.0025	Non-Normal Distribution

### F1 Survival Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	0.978	0.882	1.000	1.000	0.933	1.000	0.022	3.94%	0.00%
0	N	3	0.979	0.890	1.000	1.000	0.938	1.000	0.021	3.69%	-0.14%

### Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 22 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 05-8411-6224	Endpoint: n Offspring Per Female	CETIS Version: CETISv1.9.5			
Analyzed: 02 Apr-19 19:47	Analysis: Parametric-Control vs Treatments	Status Level: 1			
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)	Analyst:			
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent: Laboratory seawater + laboratory fresh			
Ending Date: 17 Nov-17	Species: Americamysis bahia	Brine:			
Test Length: 28d 0h	Taxon:	Source: Lab In-House Culture		Age:	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	
Untransformed	C > T	0.0661	0.134	0.09411	PMSD 47.89%

## Dunnett Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393	0.0252	2.53	13.4	4	CDF	0.8503	Non-Significant Effect
		0.00745	-0.322	2.53	13.4	4	CDF	0.9261	Non-Significant Effect
		0.0164	1.04	2.53	13.4	4	CDF	0.4386	Non-Significant Effect
		0.033	0.303	2.53	13.4	4	CDF	0.7601	Non-Significant Effect
		0.0661	2.18	2.53	13.4	4	CDF	0.0914	Non-Significant Effect
		0.134*	4.92	2.53	13.4	4	CDF	5.7E-04	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	1737.23	289.538	6	6.92	0.0014	Significant Effect
Error	586.019	41.8585	14			
Total	2323.25		20			

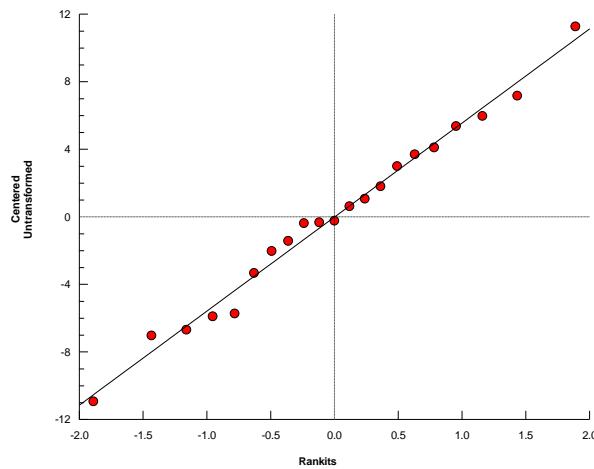
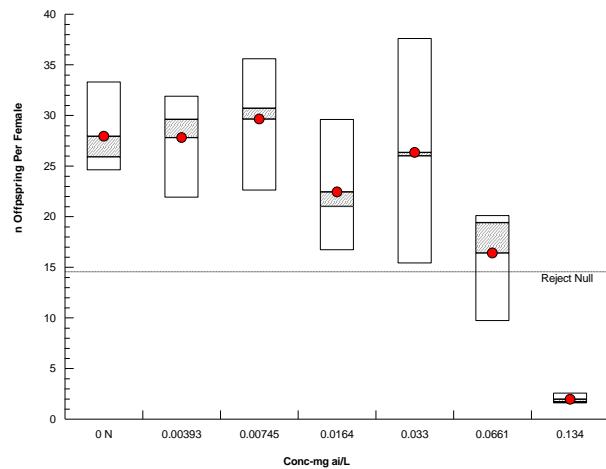
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	8.57	16.8	0.1991	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.989	0.871	0.9966	Normal Distribution

## n Offspring Per Female Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	27.9	16.3	39.6	25.9	24.6	33.3	2.71	16.80%	0.00%
0.00393		3	27.8	14.8	40.8	29.6	21.9	31.9	3.02	18.84%	0.48%
0.00745		3	29.6	13.3	45.9	30.7	22.6	35.6	3.79	22.16%	-6.09%
0.0164		3	22.4	6.12	38.8	21	16.7	29.6	3.79	29.28%	19.69%
0.033		3	26.3	-1.25	53.9	26	15.4	37.6	6.41	42.17%	5.73%
0.0661		3	16.4	1.98	30.8	19.4	9.71	20.1	3.35	35.40%	41.28%
0.134		3	1.95	0.605	3.3	1.71	1.57	2.57	0.313	27.77%	93.02%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 23 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)				
Analysis ID:	20-6848-0702	Endpoint:	n Offspring Per Female	CETIS Version:	CETISv1.9.5			
Analyzed:	02 Apr-19 19:47	Analysis:	Parametric-Control vs Ord.Treatments	Status Level:	1			
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:				
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh			
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:				
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture			
Data Transform	Alt Hyp			NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T			0.033	0.0661	0.0467		36.05%

## Williams Multiple Comparison Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	0.0252	1.76	9.3	4	CDF	>0.05	Non-Significant Effect	
	0.00745	-0.148	1.85	9.77	4	CDF	>0.05	Non-Significant Effect	
	0.0164	1.04	1.88	9.92	4	CDF	>0.05	Non-Significant Effect	
	0.033	0.672	1.89	9.99	4	CDF	>0.05	Non-Significant Effect	
	0.0661*	2.18	1.9	10	4	CDF	<0.05	Significant Effect	
	0.134*	4.92	1.91	10.1	4	CDF	<0.05	Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	1737.23	289.538	6	6.92	0.0014	Significant Effect
Error	586.019	41.8585	14			
Total	2323.25		20			

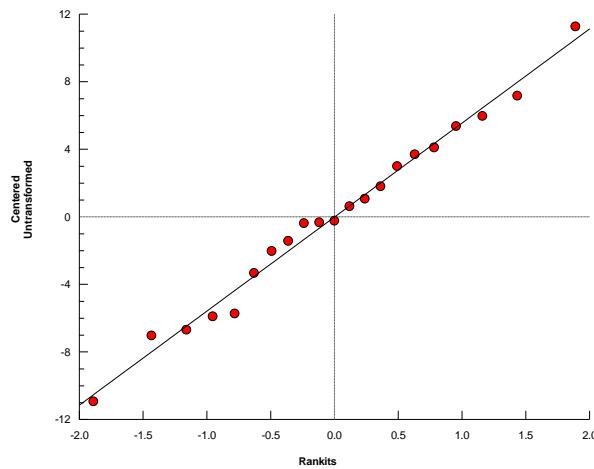
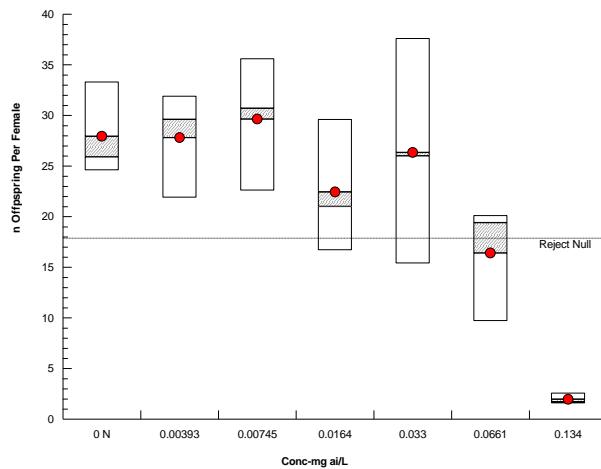
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	8.57	16.8	0.1991	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.989	0.871	0.9966	Normal Distribution

## n Offspring Per Female Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	27.9	16.3	39.6	25.9	24.6	33.3	2.71	16.80%	0.00%
0.00393		3	27.8	14.8	40.8	29.6	21.9	31.9	3.02	18.84%	0.48%
0.00745		3	29.6	13.3	45.9	30.7	22.6	35.6	3.79	22.16%	-6.09%
0.0164		3	22.4	6.12	38.8	21	16.7	29.6	3.79	29.28%	19.69%
0.033		3	26.3	-1.25	53.9	26	15.4	37.6	6.41	42.17%	5.73%
0.0661		3	16.4	1.98	30.8	19.4	9.71	20.1	3.35	35.40%	41.28%
0.134		3	1.95	0.605	3.3	1.71	1.57	2.57	0.313	27.77%	93.02%

## Graphics

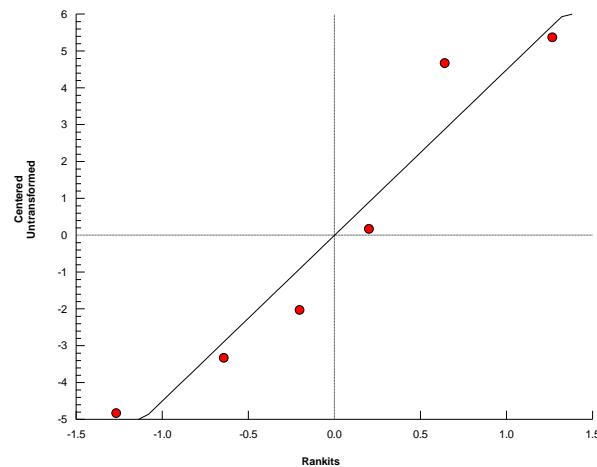
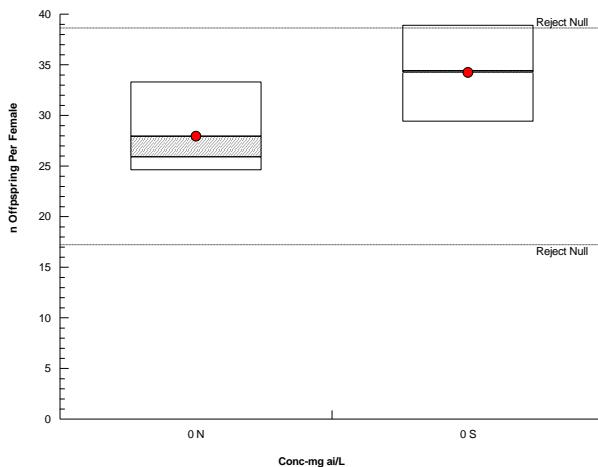


# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 24 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)							EAG (ABC Lab)				
Analysis ID: 19-1586-0273 Analyzed: 02 Apr-19 19:48	Endpoint: n Offspring Per Female Analysis: Parametric-Two Sample				CETIS Version: CETISv1.9.5 Status Level: 1						
Batch ID: 01-1053-3132 Start Date: 20 Oct-17 Ending Date: 17 Nov-17 Test Length: 28d 0h	Test Type: Chronic Mysid (28-d) Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life Species: Americamysis bahia Taxon:				Analyst: Diluent: Laboratory seawater + laboratory fresh Brine: Source: Lab In-House Culture	Age:					
Data Transform	Alt Hyp				Comparison Result			PMSD			
Untransformed	C <> T				Solvent Blank passed n offspring per female 38.33%						
<b>Equal Variance t Two-Sample Test</b>											
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)		
Negative Control	Solvent Blank		1.63	2.78	10.7	4	CDF	0.1776	Non-Significant Effect		
<b>ANOVA Table</b>											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)					
Between	59.535	59.535	1	2.67	0.1776	Non-Significant Effect					
Error	89.2133	22.3033	4								
Total	148.748		5								
<b>ANOVA Assumptions Tests</b>											
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)					
Variance	Variance Ratio F Test		1.03	199	0.9874	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.908	0.43	0.4206	Normal Distribution					
<b>n Offspring Per Female Summary</b>											
Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	34.2	22.4	46	34.4	29.4	38.9	2.74	13.88%	0.00%
0	N	3	27.9	16.3	39.6	25.9	24.6	33.3	2.71	16.80%	18.40%

## Graphics

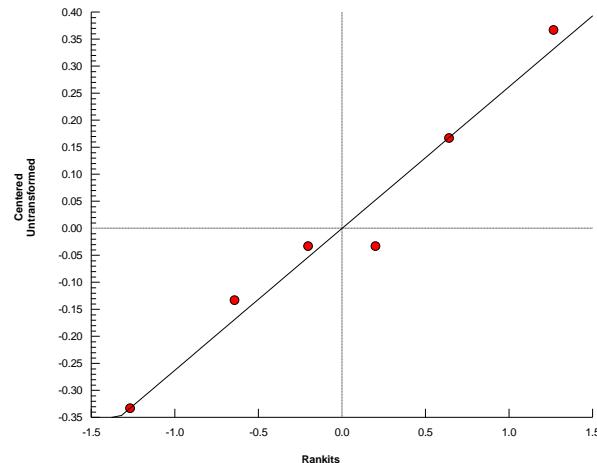
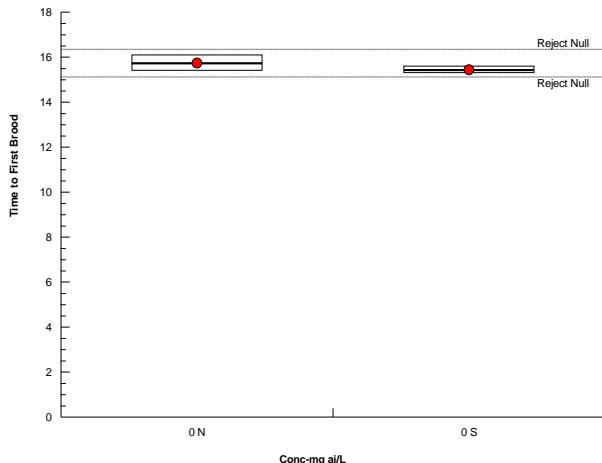


# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 25 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)							EAG (ABC Lab)				
Analysis ID: 14-8479-3163 Analyzed: 02 Apr-19 19:48	Endpoint: Time to First Brood Analysis: Parametric-Two Sample				CETIS Version: CETISv1.9.5 Status Level: 1						
Batch ID: 01-1053-3132 Start Date: 20 Oct-17 Ending Date: 17 Nov-17 Test Length: 28d 0h	Test Type: Chronic Mysid (28-d) Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life Cycle) Species: Americamysis bahia Taxon:				Analyst: Diluent: Laboratory seawater + laboratory fresh Brine: Source: Lab In-House Culture	Age:					
Data Transform	Alt Hyp				Comparison Result			PMSD			
Untransformed	C <> T				Solvent Blank passed time to first brood			3.90%			
<b>Equal Variance t Two-Sample Test</b>											
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision( $\alpha$ :5%)		
Negative Control	Solvent Blank		1.36	2.78	0.614	4	CDF	0.2464	Non-Significant Effect		
<b>ANOVA Table</b>											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha$ :5%)					
Between	0.135	0.135	1	1.84	0.2464	Non-Significant Effect					
Error	0.293333	0.0733333	4								
Total	0.428333		5								
<b>ANOVA Assumptions Tests</b>											
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha$ :1%)					
Variance	Variance Ratio F Test		5.29	199	0.3182	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.973	0.43	0.9131	Normal Distribution					
<b>Time to First Brood Summary</b>											
Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	15.4	15.1	15.8	15.4	15.3	15.6	0.0882	0.99%	0.00%
0	N	3	15.7	14.9	16.6	15.7	15.4	16.1	0.203	2.23%	-1.94%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 26 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)	
Analysis ID: 21-2388-3553	Endpoint: Time to First Brood			CETIS Version: CETISv1.9.5	
Analyzed: 02 Apr-19 19:49	Analysis: Nonparametric-Two Sample			Status Level: 1	
Batch ID: 01-1053-3132	Test Type: Chronic Mysid (28-d)			Analyst:	
Start Date: 20 Oct-17	Protocol: OPPTS 850.1350 Chronic Invert (Mysid Life			Diluent: Laboratory seawater + laboratory fresh	
Ending Date: 17 Nov-17	Species: Americamysis bahia			Brine:	
Test Length: 28d 0h	Taxon:			Source: Lab In-House Culture	Age:
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C < T	0.0661	0.134	0.09411	10.63%

## Mann-Whitney U Two-Sample Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control	0.00393	7	n/a	0	4	Exact	0.2000	Non-Significant Effect	
	0.00745	5.5	n/a	1	4	Exact	0.4000	Non-Significant Effect	
	0.0164	1.5	n/a	1	4	Exact	0.9500	Non-Significant Effect	
	0.033	3	n/a	0	4	Exact	0.8000	Non-Significant Effect	
	0.0661	8.5	n/a	1	4	Exact	0.1000	Non-Significant Effect	
	0.134*	9	n/a	0	4	Exact	0.0500	Significant Effect	

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	31.8648	5.31079	6	5.75	0.0034	Significant Effect
Error	12.9267	0.923333	14			
Total	44.7914		20			

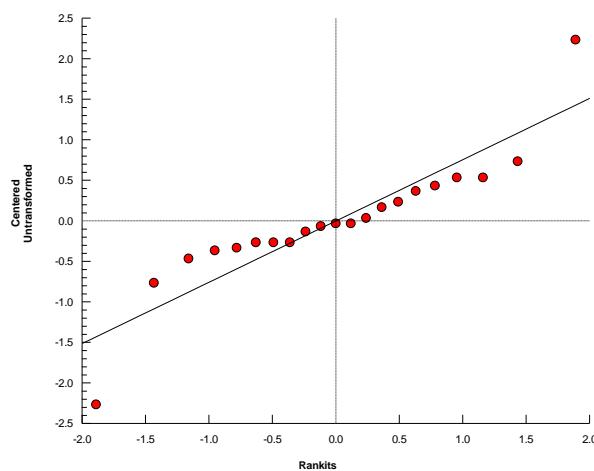
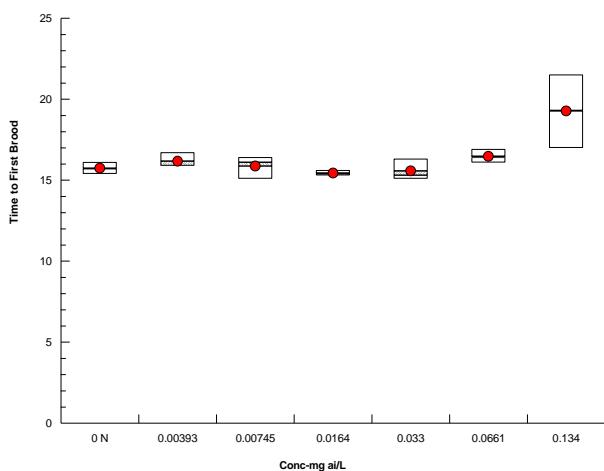
## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	14.6	16.8	0.0238	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.864	0.871	0.0075	Non-Normal Distribution

## Time to First Brood Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	15.7	14.9	16.6	15.7	15.4	16.1	0.203	2.23%	0.00%
0.00393		3	16.2	15	17.3	15.9	15.9	16.7	0.267	2.86%	-2.75%
0.00745		3	15.9	14.2	17.6	16.1	15.1	16.4	0.393	4.29%	-0.85%
0.0164		3	15.4	15.1	15.8	15.4	15.3	15.6	0.0882	0.99%	1.91%
0.033		3	15.6	14	17.2	15.3	15.1	16.3	0.371	4.13%	1.06%
0.0661		3	16.5	15.5	17.5	16.4	16.1	16.9	0.233	2.45%	-4.66%
0.134		3	19.3	13.7	24.9	19.3	17	21.5	1.3	11.68%	-22.46%

## Graphics



# CETIS Analytical Report

Report Date: 02 Apr-19 19:52 (p 27 of 27)  
 Test Code/ID: 125618 50621301 / 00-2088-2028

OPPTS 850.1350 Chronic Invert (Mysid)				EAG (ABC Lab)		
Analysis ID:	00-7237-8470	Endpoint:	Time to First Brood	CETIS Version:	CETISv1.9.5	
Analyzed:	02 Apr-19 19:50	Analysis:	Nonparametric-Control vs Ord. Treatments	Status Level:	1	
Batch ID:	01-1053-3132	Test Type:	Chronic Mysid (28-d)	Analyst:		
Start Date:	20 Oct-17	Protocol:	OPPTS 850.1350 Chronic Invert (Mysid Life	Diluent:	Laboratory seawater + laboratory fresh	
Ending Date:	17 Nov-17	Species:	Americamysis bahia	Brine:		
Test Length:	28d 0h	Taxon:		Source:	Lab In-House Culture	
Data Transform	Alt Hyp		NOEL	LOEL	TOEL	TU
Untransformed	C < T		0.0661	0.134	0.09411	

## Jonckheere-Terpstra Step-Down Test

Control	vs	Conc-mg ai/L	Test Stat	Critical	Ties	P-Type	P-Value	Decision( $\alpha:5\%$ )
Negative Control		0.00393	1.11	1.64	1	Asymp	0.8892	Non-Significant Effect
		0.00745	0.673	1.64	2	Asymp	0.8892	Non-Significant Effect
		0.0164	-0.858	1.64	3	Asymp	0.8892	Non-Significant Effect
		0.033	-1.22	1.64	5	Asymp	0.8892	Non-Significant Effect
		0.0661	0.387	1.64	6	Asymp	0.3493	Non-Significant Effect
		0.134*	1.96	1.64	6	Asymp	0.0248	Significant Effect

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )
Between	31.8648	5.31079	6	5.75	0.0034	Significant Effect
Error	12.9267	0.923333	14			
Total	44.7914		20			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )
Variance	Bartlett Equality of Variance Test	14.6	16.8	0.0238	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.864	0.871	0.0075	Non-Normal Distribution

## Time to First Brood Summary

Conc-mg ai/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	15.7	14.9	16.6	15.7	15.4	16.1	0.203	2.23%	0.00%
0.00393		3	16.2	15	17.3	15.9	15.9	16.7	0.267	2.86%	-2.75%
0.00745		3	15.9	14.2	17.6	16.1	15.1	16.4	0.393	4.29%	-0.85%
0.0164		3	15.4	15.1	15.8	15.4	15.3	15.6	0.0882	0.99%	1.91%
0.033		3	15.6	14	17.2	15.3	15.1	16.3	0.371	4.13%	1.06%
0.0661		3	16.5	15.5	17.5	16.4	16.1	16.9	0.233	2.45%	-4.66%
0.134		3	19.3	13.7	24.9	19.3	17	21.5	1.3	11.68%	-22.46%

## Graphics

